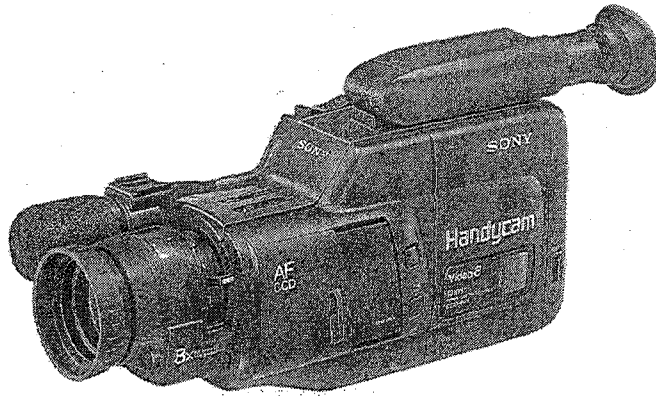


CCD-F45/F46/F360

284

SERVICE MANUAL



CCD-F45

US Model

CCD-F45/F46

Canadian Model

CCD-F45

E Model

CCD-F360

**Handycam
Video 8**

SPECIFICATIONS

For MECHANICAL ADJUSTMENTS,
refer to the "U MECHANISM"
(9-972-732-11).

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP: Approx. 1.43 cm/sec. LP: Approx. 0.72 cm/sec. (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours LP mode: 4 hours (P6-120)
Fast forward/rewind time	Approx. 6.5 min. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8 × power zoom lens f = 8.5-68 mm, F1.6 with macro Filter diameter: 46 mm
Auto focus system	TTL
Color temperature	AUTO HOLD INDOOR 3,200 K OUTDOOR 5,800 K
Minimum illumination	3 lux
Illumination range	3 lux-100,000 lux (0.3-9,294 footcandles)

Recommended illumination

More than 300 lux
(28 footcandles)

Aperture correction

Automatic
Back light adjustment

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack, -7.5 dBs, at output impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5V DC
Video input	Phono jack, 1 Vp-p, 75 ohms unbalanced, sync negative
Audio input	Phono jack, -7.5 dBs, input impedance more than 47 kilohms
Earphone jack	Minijack, 8-ohm impedance
Remote jack	Stereo mini-minijack
MIC jack	Minijack, -66 dBs, low impedance With 2.5-3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

— Continued on next page —



8 VIDEO CAMERA RECORDER
SONY®

Display in the viewfinder

Mode and caution indicators

Caution:  /  /  /  / 

Mode: REC/STBY/PAUSE/

 ,  (Editsearch)/

 /  STILL/PLAY/

 /  SLOW/   

LP mode, AM/PM, FOCUS,

 WHITE BALANCE, ZERO

MEM, shutter speed

Recording/battery lamp

General

Power requirements	Battery compartment 6.0 V (battery pack)/7.5 V (AC power adaptor)/9.0 V (alkaline batteries)
Power consumption	6.9 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)
Dimensions	Approx. 122 x 153 x 317 mm (w/h/d) (4 7/8 x 6 1/8 x 12 1/2 in.)
Weight	including lens hood Approx. 1.2 kg (2 lb 10 oz) excluding the battery and cassette
Microphone	Electret condenser microphone, uni-directional monaural type
Supplied accessories	• Battery pack NP-55 (1) • AC power adaptor AC-V30 (1) • RFU adaptor RFU-89UCA (1) (CCD-F45/F46) • RFU adaptor RFU-89NA(1) (CCD-F360) • Antenna selector (1) • Lithium battery CR2025 (1) • Lens cap (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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The color reproduction standard frame is contained after the adjustment element location of camera adjustment parts.

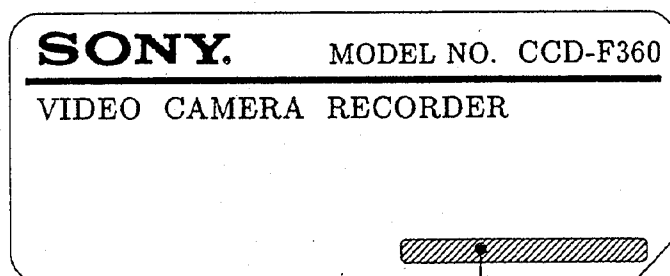
CAUTION

1. In this unit, A or B type EVF is used.

Type A	Color of connecting harness (VF-21) which connects EVF and CV-8 board is gray. (VF-14 board)
Type B	Color of connecting harness (VF-21) is white. (VF-22 board)

Note: Distinction between Venezuelan model and other models.

Model number label



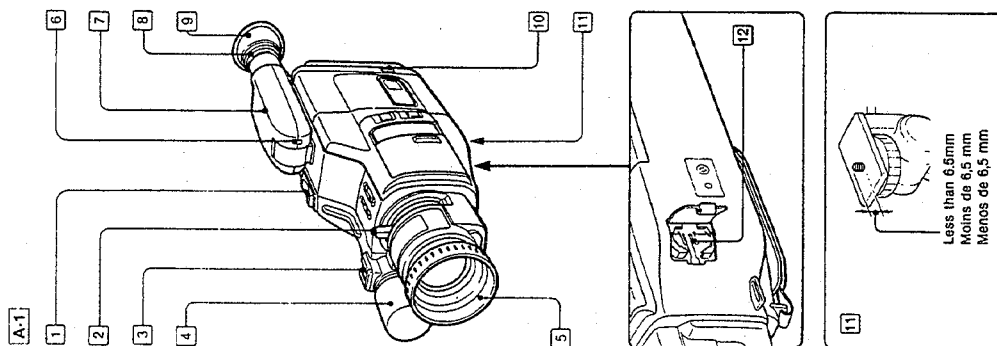
HECHO EN VENEZUELA : Venezuelan model
MADE IN JAPAN : Other models

SECTION 1 GENERAL

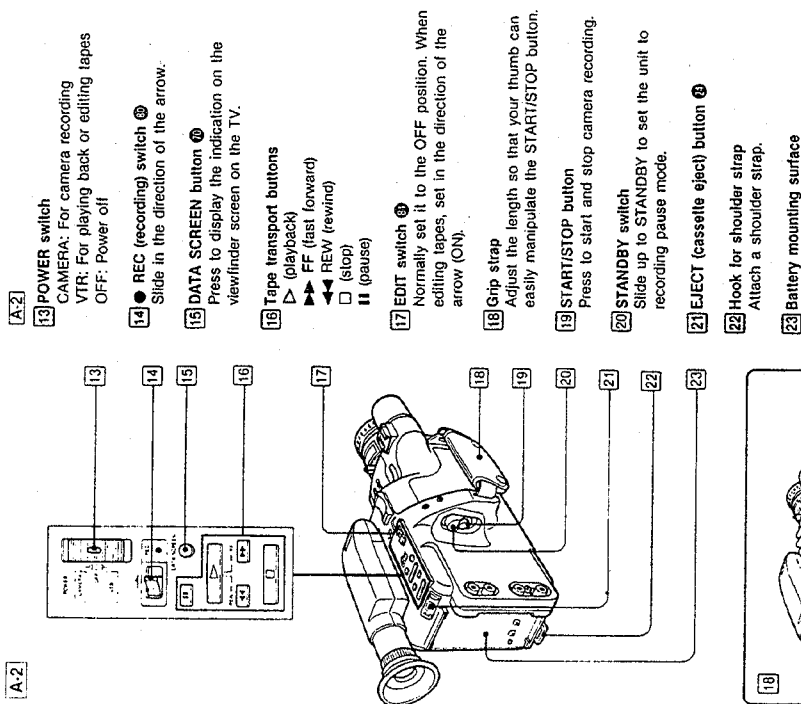
This section is extracted from
CCD-F45 instruction manual.

Location and Function of Parts and Controls

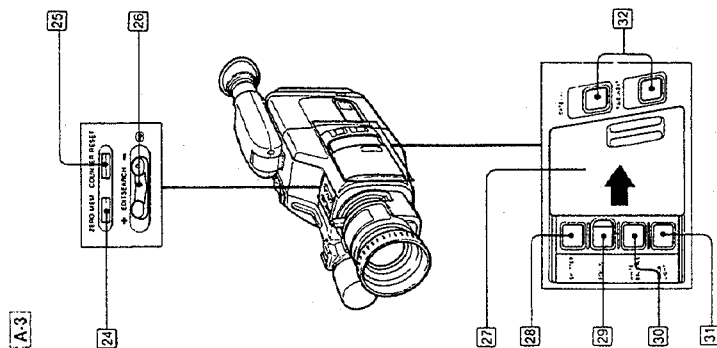
For details on the use of each control, refer to
the pages indicated in the circle.



Location and Function of Parts and Controls



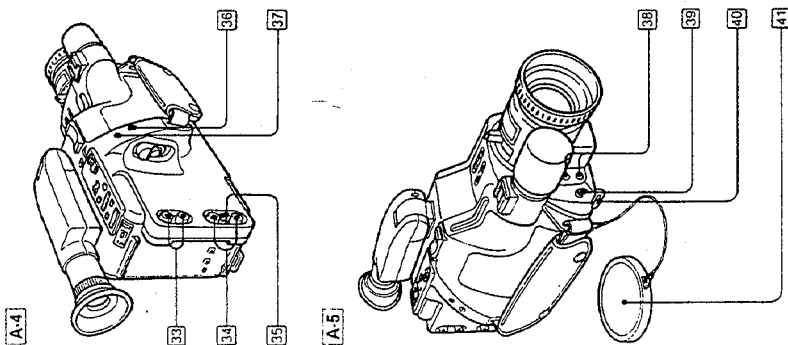
Location and Function of Parts and Controls



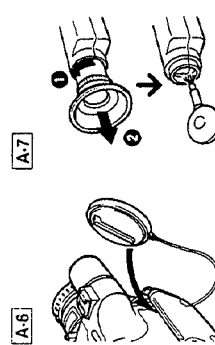
- A-3** **24** ZERO MEM (zero memory) button **24** **25**
Used to memorize the counter zero point.
- 25** COUNTER RESET button **25** **26**
Press to reset the counter to zero.
- 26** EDITSEARCH (and recording review) button **26** **27**
27 AUTO LOCK cover **27**
Keep this cover closed when adjusting the focus, white balance, or shutter speed automatically. To adjust these manually, slide open this cover so that the buttons inside can be seen.
- 28** SHUTTER SPEED button **28**
Used to select the shutter speed.
- 29** FOCUS button **29**
Used for manual focusing.
- 30** WHITE BAL (white balance) button **30**
Used for manual white balance adjustment.
- 31** BACK LIGHT button **31**
- 32** DATE (+) and TIME (NEXT) buttons **32**
Press to display or turn off the date or time.

10

Location and Function of Parts and Controls



- A-4** **33** VIDEO/AUDIO IN (input) jacks (phono jacks) **33** **34**
34 VIDEO/AUDIO OUT (output) jacks (phono jacks)
- 35** RFU DC OUT (RFU adaptor DC output) jack (special minijack) **35**
Supplies power to the RFU adaptor.
- 36** earphone) jack (minijack) **36** **37**
37 REMOTE connector (stereo mini-minijack)
Connect an optional GP-90 Remote Commander or wired Remote Commander RM-95.
Do not connect other equipment.
- A-5** **38** MIC jack and DC OUT (microphone power output) jack **38**
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.
- 39** REC START/STOP button for low position **39**
- 40** Hook for shoulder strap **40**
Attach a shoulder strap.



- A-6** **41** Lens cap **41**
Squeeze both sides of the lens cap to remove it. Hook it to the grip strap so it won't be lost or hanging loose while recording.
- A-7** **40** Hook for shoulder strap **40**
To remove dust from inside the viewfinder
Detach the eyecup as illustrated and clean the surface of the cathode ray tube with a blower.

12

Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

Place		Power source	Accessory to be used
Indoors	House current	House current	AC power adaptor AC-V30 or AC-V55 (page 16)
	Battery pack	Battery pack	Battery pack NP-55 or large capacity battery pack NP-77 and NP-68H (available soon) (page 16) Battery case EBP-55 (page 18)
In the car	12 V or 24 V car battery	DC pack DCP-55 (page 20) (DCC-16B car battery cord supplied)	

Notes on power source

- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, supply the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is not to be used, keep it in its case.

Optional Accessories for Charging

- AC-V55 AC power adaptor
The battery pack can be charged simultaneously.
- DCC-V30 car battery charger
Connect to the cigarette lighter socket of a car to charge an NP-55 or NP-77 battery pack, or to supply power to Sony 8 mm video equipment that operates only on NP-55 or NP-77.

Power Sources

Battery Pack — NP-55 or Large Capacity Battery Pack NP-68H/77

First, charge the battery pack. [B-1]
Use the AC-V30 AC power adaptor.
The charging time is about 1 hour for an NP-55 battery pack, about 1 hour and 40 minutes for an NP-68H battery pack or about 2 hours for an NP-77 battery pack.

- 1 Connect the AC-V30 to a wall outlet.
- 2 Attach the battery pack to the AC-V30. Align the grooves on the battery pack with those on the AC-V30, and while pressing the battery pack, slide it as illustrated.

To attach the battery pack to the video camera recorder [B-2]
Align the right side of the battery pack with the line on the recorder, and while pressing the battery pack, slide it to the right. Make sure that the battery is fitted completely to the mounting surface. Imperfect fit may damage the projections on the recorder.

To remove the battery pack [B-3]
While pressing the BATT knob in the arrow direction, slide and pull out the battery pack as illustrated.

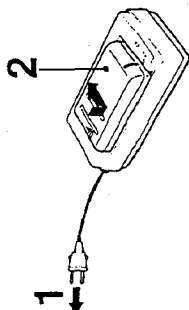
Battery life

A fully-charged NP-55 battery pack provides approximately 40 minutes of continuous camera recording, an NP-68H provides approximately 70 minutes of continuous camera recording and an NP-77 provides approximately 80 minutes of continuous camera recording.

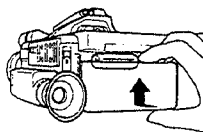
When the video camera recorder is not in use, remove the battery pack. If the battery is installed, even if the POWER switch is set to OFF, a very small amount of electric current flows.

When the battery becomes weak [B-4]
The  indication and red lamp blink in the viewfinder. Replace the battery pack with the fully charged one.

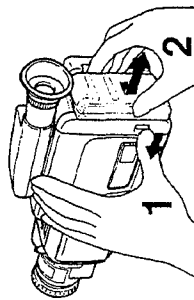
[B-1]



[B-2]



[B-3]



[B-4]



Power Sources

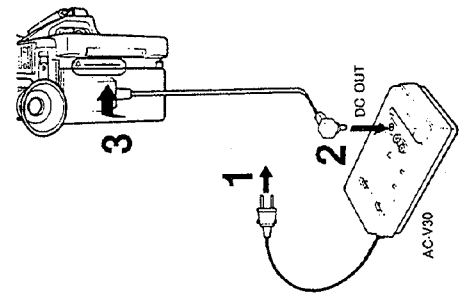
House Current — Using AC Power Adaptor [B-6]

- 1 Connect the AC power adaptor to a wall outlet.
- 2 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.
- 3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.

To remove the connecting plate for the AC power adaptor from the video camera recorder While pressing the BATT knob on the recorder, slide and pull out the connecting plate.

The optional AC-V55 AC power adaptor can also be used to operate this recorder on house current.

[B-6]



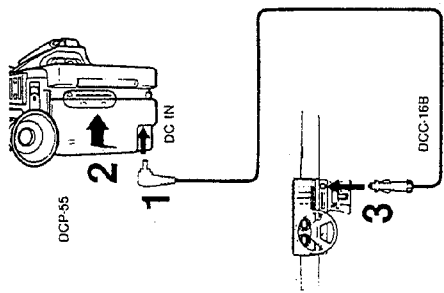
Car Battery — Using the DC Pack [B-7]

- 1 Insert the DCC-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.
- 2 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.
- 3 Connect the DCC-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack from the video camera recorder While pressing the BATT knob on the recorder, slide and pull out the DC pack.

The optional AC-V55 AC power adaptor and the DCC-16AW car battery cord can also be used to operate this recorder on a 12V or 24V car battery.

[B-7]



Power Sources

Notes

- The video camera recorder consumes power even in the recording pause mode. When recording short scenes using the recording pause mode, the battery life is less than half that of continuous recording.
- When recording is not to be started soon, turn off the power with the STANDBY switch.
- If the battery pack is not fully charged or it is used in a cold place, its operating time is also shortened.

Battery Case EBP-55 [B-5]

- 1 Insert the six R6 (size AA) alkaline batteries into the battery case.
- 2 Align the right side of the battery case with the line on the recorder, and while pressing the battery case, slide it to the right.

To remove the battery case While pressing the BATT knob on the recorder, slide and pull out the battery case.

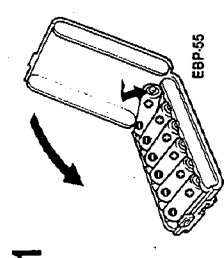
Battery Life

With new alkaline batteries, the battery case provides approximately 40 minutes of continuous camera recording when used indoors.

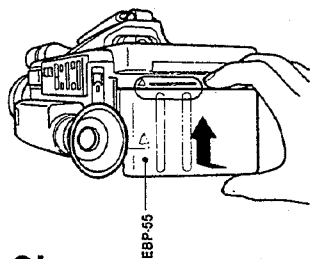
Notes on the battery case

- Be sure to use the alkaline batteries.
- The battery case cannot be used in a cold place.
- The CL indication may not blink when the batteries in the battery case become weak, as the voltage of the battery lowers suddenly. If the cassette compartment does not open, replace the batteries.

[B-5]



2



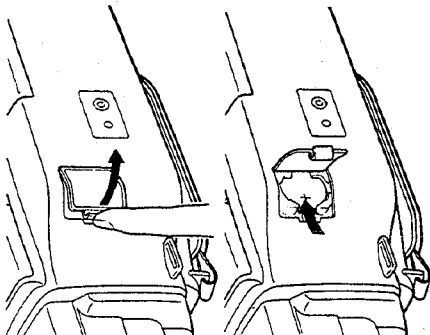
Power Sources

Lithium Battery [C-1]

To insert the lithium battery
This unit uses a lithium battery to activate the clock. Before operating the unit for the first time, install the supplied lithium battery:

- 1 Open the cover of the lithium battery compartment on the bottom.
- 2 Install the supplied CR2025 lithium battery with the ⊕ side facing out.
- 3 Close the cover.

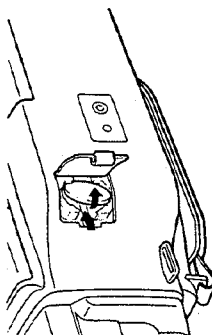
[C-1]



To remove the lithium battery [C-2]
Press the side of the battery in the direction as indicated for installation.

Lithium battery life
Approximately 1 year in normal operation. When the lithium battery becomes weak, the time indication will blink on the viewfinder screen for about 5 seconds, whenever the POWER switch is set to CAMERA. In this case, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion. After replacing the battery, readjust the date and time. (If the battery is replaced with the battery pack attached, the readjustments are not necessary.)

[C-2]



- Notes on Lithium Battery**
- Keep the lithium battery out of the reach of children.
 - Should the battery be swallowed, immediately consult a doctor.
 - Wipe the battery with a dry cloth to assure a good contact.
 - Be sure to observe the correct polarity when installing the battery.
 - Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
 - Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

WARNING

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

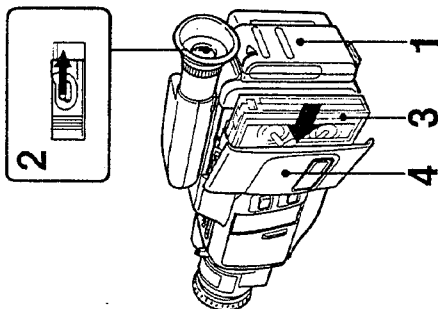
22

Cassette Care

Cassette Insertion [D-1]

- 1 Connect a power source.
- 2 Slide the EJECT button while pressing the center blue button. The lid of the cassette compartment will open.
- 3 Insert a cassette with the window facing outside.
- 4 Press the PUSH mark to close the cassette holder.

[D-1]



Cassette Ejection

- 1 Make sure that a power source is connected.
- 2 Slide the EJECT button while pressing the center blue button.
- 3 Take out the cassette and press the PUSH mark to close the cassette holder.

To Prevent Accidental Erasure [D-2]

Slide out the tab on the cassette so that it covers the opening. (A red mark will appear.)

To rerecord on the cassette, slide the tab in to uncover the opening.

Notes

- When inserting or removing the cassette, stand the unit upright. Otherwise, the cassette may be damaged.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, run the video camera recorder for about 15 seconds at the beginning of a cassette before recording. It will avoid missing the starting point during playback on a video cassette recorder.

[D-2]



24

Camera Operation

Adjustment of the Viewfinder Lens

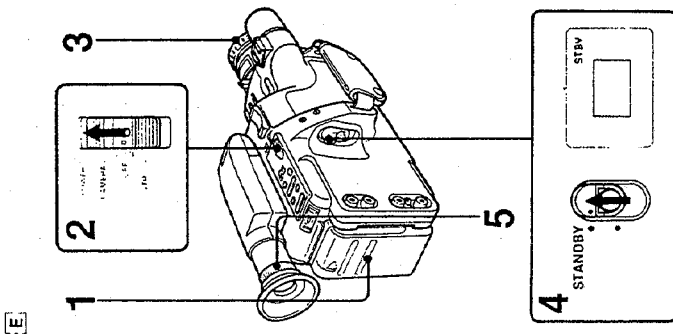
The position of the viewfinder lens for optimum vision varies depending on the person. [E]

- 1 Connect a power source.
- 2 While pressing the small button, set the POWER switch to CAMERA.
- 3 Remove the lens cap.
- 4 Slide the STANDBY switch up.
- 5 Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.

Adjustment of the viewfinder lens is necessary only for your initial use, or for use after someone else.

Note

If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording pause mode, slide the STANDBY switch down once and slide it up again. To start recording, press the START/STOP button.



Selection of the Automatic or Manual Adjustments

When the AUTO LOCK cover is closed, the white balance, shutter speed (1/60), and focus are adjusted automatically. But under certain circumstances, manual adjustment is better for effective recording.

When the AUTO LOCK cover is slid open, each manual function works as follows.

Each push of the button cyclically changes each function and the indication on the viewfinder changes.	
WHITE BALANCE See page 42.	[] No indication → HOLD → [] → [] (Auto)
SHUTTER SPEED See page 48.	[] No indication (1/60) → 100 → 250 → 1000 → 2000 → 4000 (1/100)(1/250)(1/1000)(1/2000)(1/4000)
FOCUS See page 38.	[] Auto focusing zone → [] (Manual)
BACK LIGHT See page 46.	[] No indication → [] (Back light)

Notes

- Just after the battery pack has been attached to the recorder, the AUTO LOCK function will work, even if the AUTO LOCK cover is opened.
- If the AUTO LOCK cover is closed after each function is adjusted manually, and then opened again, the previous manual setting will be recalled.

Easy Camera Recording with Automatic Adjustment

How to Record

[F-1]

- 1 While pressing the small button, set the POWER switch to CAMERA.
 - 2 Insert the cassette.
 - 3 Keep the AUTO LOCK cover closed.
 - 4 Slide the STANDBY switch up.
- The unit will enter the recording pause mode.
- 5 Press the START/STOP button.
- Recording will start.

Check on the viewfinder screen
STBY: Displayed during recording pause mode.
REC: Displayed during recording.

To stop recording

Press the START/STOP button again.
 The unit will enter the recording pause mode.
 Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

[F-2]

To check the last portion of the previous recording (Recording review)

- 1 Set the recorder in recording pause mode by pressing the START/STOP button.
- 2 Press the - (EDIT/SEARCH) button momentarily.

The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

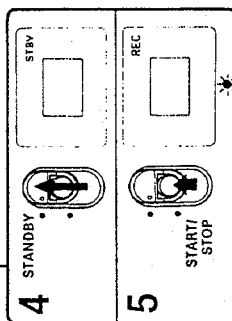
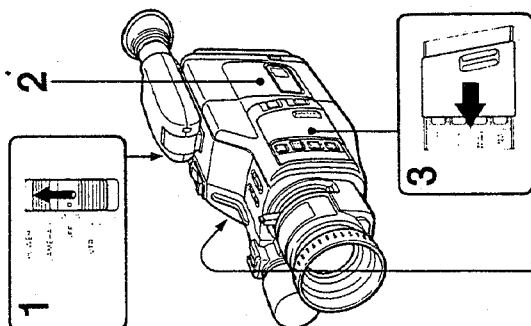
If the picture has not been recorded

The video head may be contaminated. Clean the heads using the Sony V8-25CL video head cleaning cassette.

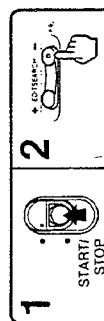
After using

Slide the STANDBY switch down and set the POWER switch to OFF. (You need not press the center button when setting the switch to OFF.)

[F-1]



[F-2]



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Easy Camera Recording with Automatic Adjustment

Hold the camera recorder as in the illustration. If your nose touches the recorder, adjust the angle of the viewfinder. [F-3]

[F-3]



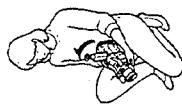
[F-4]

For low position recording

The viewfinder can be turned 90 degrees up.
 1 Slide the STANDBY switch up.
 2 Press the START/STOP button on the right front.

Note on power source
 If the POWER switch is moved during recording, the tape will stop.

[F-4]



Notes on light sources

- Should you shoot a subject in bright conditions such as sunlight just after shooting in a dark place, the picture may not appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VCR

- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, set the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

Notes on automatic adjustment

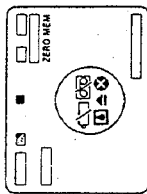
- During recording with auto focusing, do not turn or stop the focus ring (lens hood) forcibly.
- Keep the lens clean.

The camera recording with automatic adjustment may not produce optimum results under certain conditions. In this case, manually adjust the focus, white balance, back light and shutter speed. See pages 38, 42, 46 and 48.

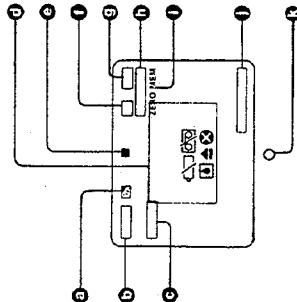
32

Easy Camera Recording with Automatic Adjustment

F-5



F-6



Indications inside the Viewfinder

Indications for caution [F-5]

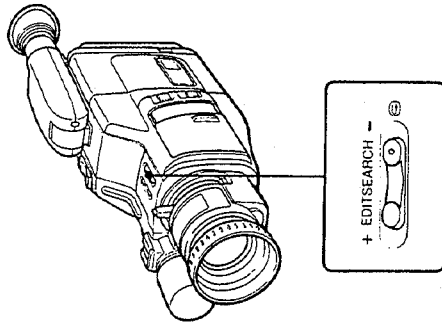
	Slow blinking • The battery is weak. Fast blinking • The battery is exhausted.
	Slow blinking • No cassette is inserted. Fast blinking (red) • The tab on the cassette is out. Fast blinking • The tape is at its end.
	Blinking • A fault has occurred in the unit. See page 122.
	Blinking • The gap of the video head is clogged. (Head contamination) See page 122.
	Blinking • Moisture has condensed inside the unit. See page 104.

Indications for showing the function in use [F-6]

	The back light function has been activated.
	Indicates the white balance mode.
	Indicates the shutter speed.
	Indicates the auto focusing zone.
	• Lights when the focus function has been set to manual. • Blinks when the auto focus function may not work correctly due to low light or low contrast. See page 38.
	Indicates the playback mode (LP).
	In the VTR operation mode, this indicates the tape transport function.
	Indicates the tape counter.
	Blinks when the ZERO MEM button has been pressed.
	Indicates the date or time.
	• Lights in red during recording. • Blinks when the battery is weak.

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F-7



Easy Camera Recording with Automatic Adjustment

Instant Playback on the Spot [F-7]

You can monitor the picture just recorded on the viewfinder screen.

- 1 While pressing the small button, set the POWER switch to CAMERA.
- 2 Slide the STANDBY switch up.
- 3 Keep pressing the "L" side of the EDITSEARCH button to view the playback picture in reverse.
- 4 Keep pressing the "R" side of the EDITSEARCH button to view the playback picture.

During Recording, to Record Again on the Previous Recorded Portion (Editsearch [F-7])

- 1 Slide the STANDBY switch up.
- 2 Monitor the picture on the viewfinder screen and locate the point from which the recording is to begin again with the EDITSEARCH button.
Keep pressing the "L" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "R" side to reverse the picture.
- 3 At the desired point, release the EDITSEARCH button.
The unit will be set to recording pause mode.
- 4 Press the START/STOP button to start recording.

Smooth recording can be made even if the recording is stopped and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But, if the cassette has been removed, proceed as above.

To monitor the sound while viewing the playback picture on the viewfinder screen

- 1 While pressing the small button, set the POWER switch to VTR.
- 2 Press the "L" button to rewind the tape.
- 3 Press the "R" button to stop the tape.
- 4 Press the "L" button to start playback.

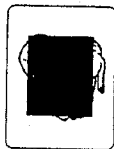
To stop the playback, press the "L" button.

36

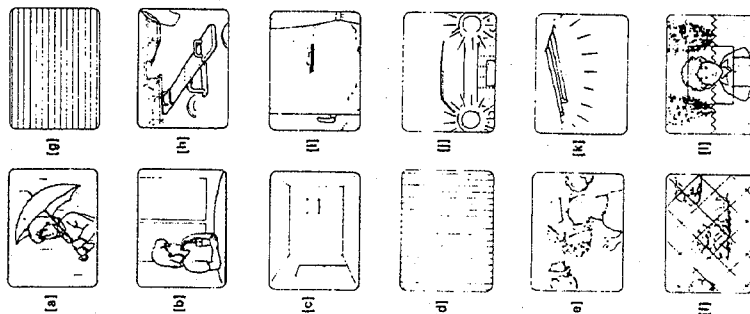
Manual Focusing

When the AUTO LOCK cover is closed, correct focusing is obtained in most cases if the subject is displayed in the auto focusing zone (illustrated in blue). [G-1]
Use manual focusing when shooting subjects difficult to focus automatically.

[G-1]



[G-2]



Poor Conditions for Auto Focusing [G-2]

- (a) Insufficient light
- (b) Too much bright light behind the subject
- (c) Subjects with flat colors and less contrast — wall, sky, etc.
- (d) Finely detailed repetitive patterns
- (e) When the distance between subjects at the center is extreme (e.g. one subject is close, the other is away)
- (f) Subjects beyond screens, nets, etc. or when another subject passes across the camera
- (g) Horizontal stripes
- (h) Diagonal stripes
- (i) When there is frosted glass between the shooting object and the recorder
- (j) Bright object or object reflecting light
- (k) When shooting under a fluorescent lamp at the shutter speed set to 1/250, 1/1000, 1/2000 or 1/4000
- (l) When there is a high contrast background within the auto focusing zone (The background may be focused)

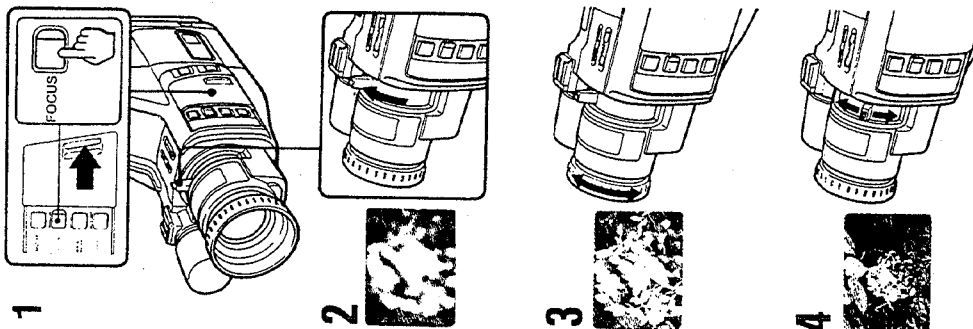
Other Uses of Manual Focusing

- When the white mark inside the viewfinder blinks
 - When using special effects lenses or filters
 - When shooting still subjects on a tripod
 - To save battery wear
- (As long as the AUTO LOCK cover is closed, the auto focusing operates and the focus ring moves automatically even in the recording pause mode. This causes the battery to wear continuously.)
- For focusing in close-up shooting, see page 54.

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Manual Focusing

[G-3]



Notes
Since the auto focusing system of this unit detects the contrast of the video signal for accurate focusing, it does not function momentarily in these cases:
• When the shutter speed or the white balance is changed
• When the back light is being adjusted
• When lighting conditions change quickly
• When the zooming is changed from wide-angle to telephoto
It may take several seconds to get focus when the camera is rapidly panned from a distant subject to a near subject with less contrast. In this case, adjust the focus manually.

Note on automatic adjustment
During recording with auto focusing, do not turn or stop the focus ring forcibly.

To Focus Manually [G-3]

- 1 Slide open the AUTO LOCK cover and press the FOCUS button.
The white mark (■) will be shown in the viewfinder.
- 2 Turn the manual zoom lever to the telephoto position (68) to make the subject as large as possible in the viewfinder.
- 3 Turn the lens hood (focus ring) to achieve sharp focus.
- 4 Set the desired shot length using the manual zoom lever.

Some helpful hints

- When shooting a scene with lots of movement in bright light, the subject can be kept in good focus by setting the zoom lever to the wide-angle position and the focus ring to 2 m, regardless of the distance between the subject and the recorder.
- When shooting in low light situations such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles, after focusing in telephoto.
- The figures on the focus ring indicate the distance between the subject and the ■ mark.
- Recommended illumination of this unit is more than 300 lux (28 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results. Under adequate light condition, the depth of field in proper focus is wider and a sharper picture will be recorded.

40

Manual White Balance Adjustment

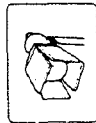
When the AUTO LOCK cover is closed, the auto white balance function of this unit operates automatically in most cases. However, if it does not work correctly in the conditions listed below, adjust the white balance manually.



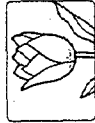
(a)



(b)



(c)



(d)



(e)



(f)



Difficult Conditions for Auto White Balance H

Recording Condition	Indication in the Viewfinder
(a) When lighting conditions change quickly	☆
(b) When the light source for the subject is different from that illuminating this unit, such as when the subject is in a spotlight, etc.	☆
(c) When shooting a monochromatic subject or the background is monochromatic	HOLD
(d) When recording under a sodium lamp	☆
(e) When recording under a mercury lamp	☆
(f) When recording under a color matching fluorescent lamp	☆
(g) When recording outdoors, such as a night view, neon sign or fireworks	☆
(h) When recording outdoors, such as scenes after sunset or scenes before sunrise.	☆

Manual White Balance Adjustment

To Adjust the White Balance Manually

- 1 While pressing the small button, set the POWER switch to CAMERA.
- 2 Slide open the AUTO LOCK cover.
- 3 Select the desired white balance mode by pressing the WHITE BAL button. Each push of the WHITE BAL button cyclically changes the indication inside the viewfinder.

No indication (Auto) → HOLD → ☆

For the color temperature and the white balance adjustment, see page 92.

To adjust the white balance precisely

- 1 Set the WHITE BAL button to auto mode (no indication).
- 2 Point the recorder to a white, flat object such as a white wall, paper, etc.
- 3 Press the WHITE BAL button to indicate the HOLD mark inside the viewfinder. The correct white balance is memorized.

Notes

- When the power is turned off or the light source is changed, reset the HOLD mode again.
- The white balance is related to back light and shutter speed adjustment. When the shutter speed has been adjusted manually with the AUTO LOCK cover opened, and then if the recorder is moved from indoors to outdoors, or vice versa, close the AUTO LOCK cover and open it again.
- When using the recorder in the automatic adjustment mode with the AUTO LOCK cover closed, and then moving from indoors to outdoors, or vice versa, slide the STANDBY switch up and point the recorder to a white object for about 10 seconds so that the white balance is adjusted properly.

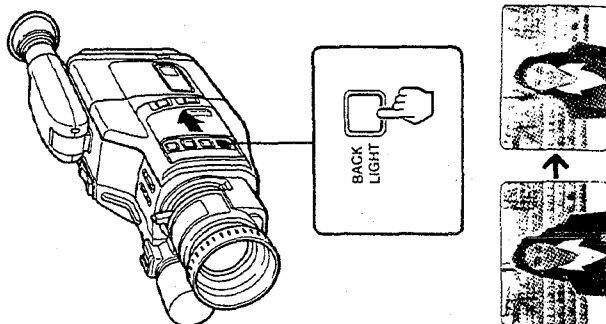
Back Light Adjustment

This unit adjusts the iris automatically. However, when shooting a subject that is backlit, slide open the AUTO LOCK cover, and press the BACK LIGHT button. The  indication appears on the viewfinder screen.

After shooting that particular scene, be sure to press the BACK LIGHT button again to release it. Otherwise the recorded picture will be too bright.

Note

The function will be released once the POWER switch is set to OFF.



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Shutter Speed Adjustment

When a fast-moving subject is recorded at a normal shutter speed, the picture may not be seen clearly when played back. This can be improved by increasing the shutter speed. The shutter speed of this unit can be selected from six speeds, 1/60 (normal speed), 1/100, 1/250, 1/1000, 1/2000 or 1/4000 second. However, when the shutter moves fast, it will not allow enough light to come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.

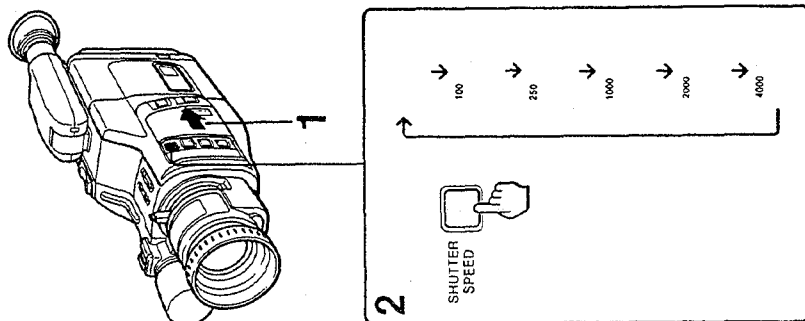
Choose an appropriate shutter speed according to the place and situation. See the chart below for examples.

Example use	Recommended shutter speed
- On clear days, recording golf or tennis scenes (To view the hit ball clearly in the pause mode, set to 1/4000) - Recording the skiers	1/4000 or 1/2000
- On overcast days, recording a moving merry-go-round or jet coaster - Recording outdoors from inside a vehicle (for stable shooting)	1/1000 or 1/250
- Instead of the ND2 filter (To reduce the exposure level to approx. 1/2) - Recording indoors (for stable shooting)	1/100

3

- Slide open the AUTO LOCK cover.
- Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen. Each time the SHUTTER SPEED button is pressed, the indication changes:
No indication → 100 → 250 → 1000 → 2000 → 4000
(1/60) (1/100) (1/250) (1/1000) (1/2000) (1/4000)

Auto focus will not function when a shutter speed other than the normal speed and 1/100 is selected under a fluorescent lamp. When shooting, use manual focusing.



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Shutter Speed Adjustment

Notes

- A ghost image will appear in still picture mode of this unit. To view a clear still or slow picture, use another video cassette deck with the clean stillslow function.
- When shutter speed 1/250 or faster is selected, recording must be done under sunlight or video light.
- When the shutter speed is changed during a camera recording of a TV screen, the brightness of the recorded picture may vary.
- When a very bright object is shot at a faster shutter speed, a light, vertical, belt-like line ("smear") may appear on the screen.
- When the recording is done under a light, discharged tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, in 50 Hz areas the brightness of the recorded picture may vary ("flicker").

Zooming

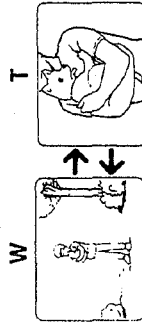
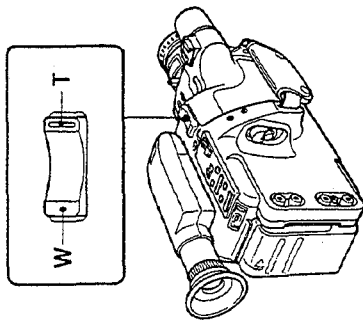
The size of the subject in the scene can be changed.

Power Zoom [K1]

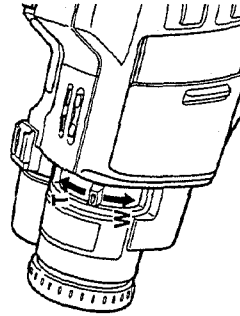
— for smooth and constant zooming

Press the T side of the power zoom button for telephoto and the W side for wide-angle. The zoom ring will move automatically.

[K-1]



[K-2]



Manual Zoom [K2]

— to create a dramatic effect

Turn the manual zoom lever upward for telephoto and downward for wide-angle.

For more zooming effect

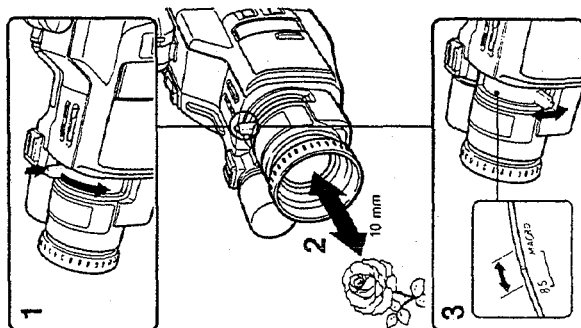
The focal length of this unit is 8.5 mm to 68 mm. Converted into the focal length of a 35 mm camera, this means approximately 14.5 mm to 363 mm.

Close-ups (Macro)

Even tiny objects can literally fill the screen for dramatic close-up effects.
Remove the lens hood before operation.

L-1

- 1 Turn the zoom lever to the MACRO position, pressing the macro set button.
- 2 Bring the recorder as close as necessary to obtain the desired subject size. The subject can be as close as approximately 10 mm ($\frac{1}{2}$ in.) from the lens surface.
- 3 Turn the zoom lever within the MACRO range to focus sharply. (The power zoom button can be used instead of the zoom lever.)



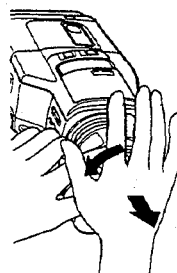
To remove the lens hood [L-2]

The lens hood also functions as focusing. To remove the lens hood, set the POWER switch to OFF and turn the hood counterclockwise with the palm of your hand.

Notes

- Auto focusing does not function in macro shooting.
- If the subject is closer than 10 mm from the lens, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.
- Zooming cannot be used in macro shooting when the zoom lever is in the MACRO range. To change the subject size in the scene, move the recorder.

L-2



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Recording Date or Time

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

- Make sure that the fully-charged battery pack and lithium battery are installed.
- Set the POWER switch to CAMERA, and slide the STANDBY switch up.

To Set Date and Time [M-1]

- 1 Press the DATE and TIME buttons simultaneously for more than 3 seconds. The date indication will appear in the viewfinder (date/time setting mode). The DATE button now functions as the + button and the TIME button functions as the NEXT button.
- 2 Adjust the 1 year, 2 month, 3 day, 4 hour and 5 minute in sequence, following the illustration.

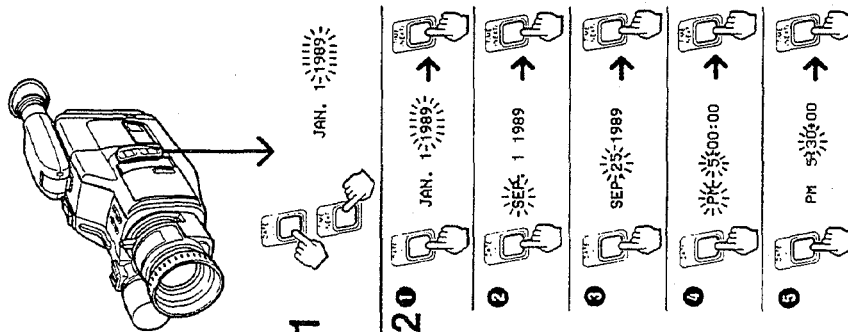
First adjust the blinking digits with the + button, and then press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display Press the TIME (NEXT) button again.

- The + button can be pressed in two ways
- When you keep the button pressed, the digits will advance continuously.
- When you press and immediately release the button, the digits will advance by one.

M-1



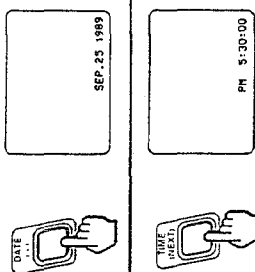
56

Recording Date or Time

To check the preset date and time
Press the DATE or TIME button in the recording pause mode. When the same button is pressed again, the indication goes off.

To readjust an incorrect date or time
Set the unit to datatime setting mode and press the NEXT button repeatedly until the incorrect digit blinks. Correct it with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

M-2



To Record the Date or Time M-2

During camera recording or in recording pause mode, press the DATE or TIME button to display the date or time on the viewfinder screen.

The date or time being displayed will be recorded together with the picture.

To stop recording the date or time
Press the DATE or TIME button again. The picture recording will continue.

Editsearch 2

You can insert (record) video and audio simultaneously from the camera onto any recorded tape. [N-1]

Operation N-2

Monitor the picture being inserted on the viewfinder screen.

- 1 While pressing the small button, set the POWER switch to CAMERA.
- 2 Slide the STANDBY switch up to set the unit to recording pause mode.
- 3 Keep pressing the "+" or "-" side of the EDITSEARCH button and release the button at the point where the insert should end. The unit will be set to recording pause mode.
- 4 Display the counter in the display window and press the COUNTER RESET button. The counter is reset to zero.
(For an accurate ending point, press the COUNTER RESET button immediately after the EDITSEARCH button is released and while the still picture is displayed.)
- 5 Keep pressing the "-" side of the EDITSEARCH button and release the button at the point where the insert should begin. Press the ZERO MEM button.
- 6 Press the ZERO MEM button.
The insert ending point is stored in memory.
- 7 Press the START/STOP button.
Insert recording will begin.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

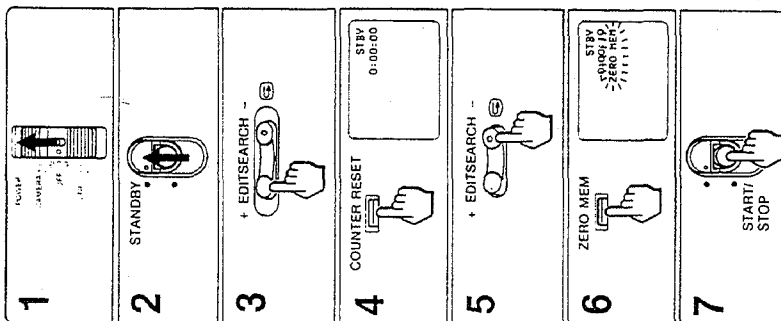
To change the insert ending point
Press the ZERO MEM button to turn off the ZERO MEM indicator and repeat steps 3 through 6 above.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

N-1



N-2



Editsrch 2

Notes on ZERO MEM mode
ZERO MEM mode is cancelled automatically in the following cases.

- When an insert recording is completed.
 - When the position of the POWER switch is changed.
 - When the power is turned off.
 - When the cassette is ejected.
- To restore it, press the ZERO MEM button again.

Notes

- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be turned off.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

Recorder Operation

Preparation for Playback

When a VCR has been connected to the TV, refer to the pages 74, 76 and 78.

Connecting a TV

Connecting a TV without audio/video input connectors [O-1]

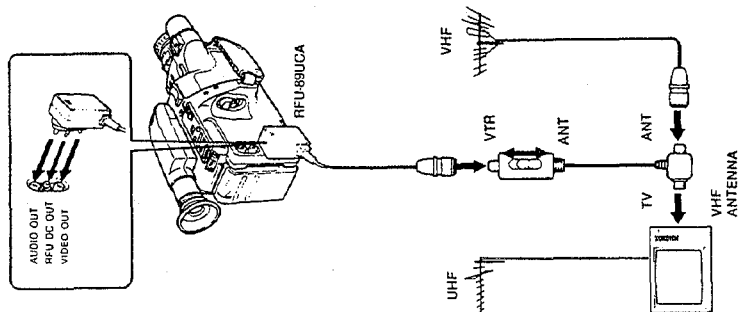
- 1 Connect the RFU adaptor to this unit.
- 2 Connect the VHF antenna, this unit and TV to the antenna selector (supplied with the RFU-89UCA).
- 3 Use a 75-ohm coaxial cable for antenna connection.
- 3 Set the selector switch on the antenna selector as follows:

For viewing a playback picture → VTR
For viewing TV programs → ANT

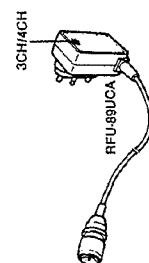
On the TV channel for the video camera recorder [O-2]

Whenever you view the playback picture, set the channel selector of the RFU adaptor to either VHF channel 3 CH or 4 CH and select the same channel on the TV.

[O-1]



[O-2]



64

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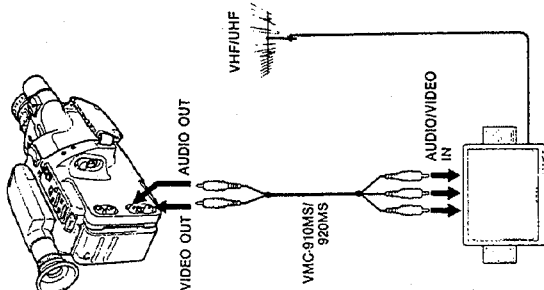
Preparation for Playback

Connecting a TV (or color monitor) equipped with audio/video input connectors **[O.3]**

- 1 Connect this unit to the TV using the optional VMC-910MS/920MS audio/video cable.
- 2 Set the TV/VIDEO selector button on the TV as follows:

For viewing a playback picture → VIDEO
For viewing TV programs → TV

[O.3]



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Playback

Turn on the TV (or color monitor), and select the channel for viewing a playback picture (or set the TV/VIDEO selector to VIDEO)

[P.1]

- 1 While pressing the small button, set the POWER switch to VTR.
- 2 Insert a cassette.
- 3 Press the ▷ button. Playback will start.

To stop the tape, press the □ button.

After using, be sure to set the POWER switch on the recorder to OFF

To view a still picture **[P.2]**

Press the II button during playback. To resume playback, press the II button again or press the ▷ button.

Monitoring a High-Speed Picture

During playback — Picture search

- 1 In the playback mode, press the ►► or ◄◄ button.

The picture will be monitored at high speed as long as it is kept pressed.

- 2 Release the ►► or ◄◄ button at the desired point.

Normal playback will resume.

During fast-forward or rewind — Skip scan

- 1 Press the ►►► button in fast-forward mode or press the ◄◄◄ button in rewind mode. The picture is displayed while the button is kept pressed.

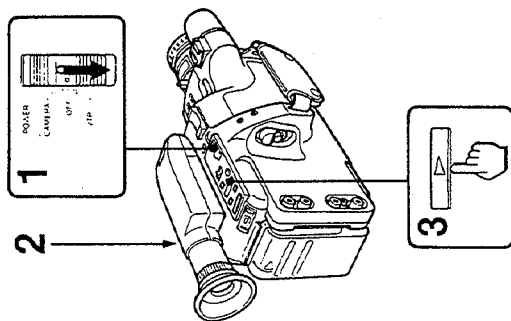
- 2 Release the ►►► or ◄◄◄ button to resume normal fast-forward or rewind mode.

- 3 Press the ▷ button to play back.

Notes

- If you move the position of the POWER switch during playback, the tape will stop. When you move the POWER switch to CAMERA in the playback pause mode, however, the unit will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.

[P.1]



[P.2]



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Playback

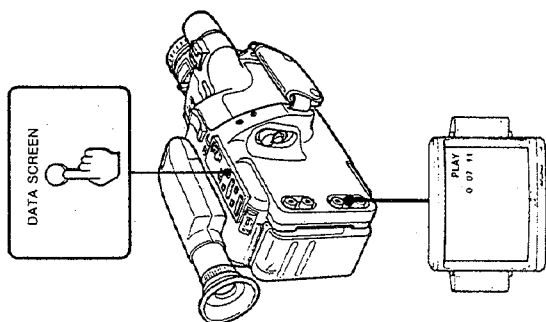
To Display the Indication on the Viewfinder Screen on the TV [Q]

Press the DATA SCREEN button.
The indication on the viewfinder screen is superimposed on the TV program.
It is convenient to check the indication on the TV screen when the playback picture is viewed on the TV or when the video camera recorder is operated from a distance using the Remote Commander.

To clear the indication, press the DATA SCREEN button again.

Note

To edit from this unit to another VCR, clear the indication on the TV or the indication will be recorded with the picture.



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Insert Recording

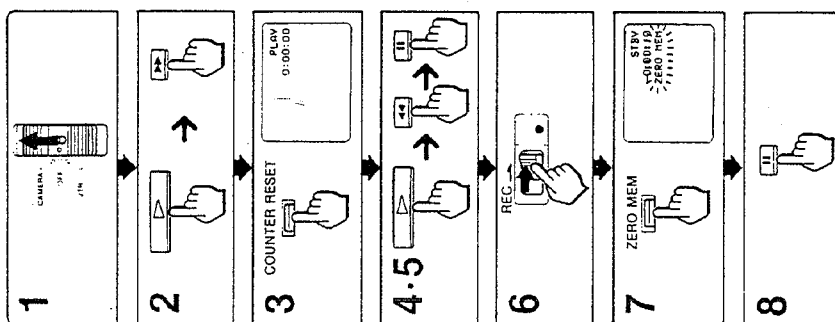
To Insert a TV Program or a Picture from Another VCR [S]

Monitor the picture being inserted on the viewfinder screen.

- 1 While pressing the small button, set the POWER switch to VTR.
- 2 Locate the point on the tape where the insert should end by pressing the ►► or ◄◄ button during playback.
- 3 Display the counter in the display window and press the COUNTER RESET button. The counter is reset to zero.
- 4 Press the ◄◄ button during playback to rewind the tape a little further than the point where the insert should begin.
- 5 Release the ◄◄ button to resume playback and press the ►► button at the insert starting point.
- 6 Slide the ● REC switch in the arrow direction to set the unit to recording pause mode.
- 7 Press the ZERO MEM button. The insert ending point is stored in memory.
- 8 To start recording, press the ►► button.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM Indicator disappears.



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Use of the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

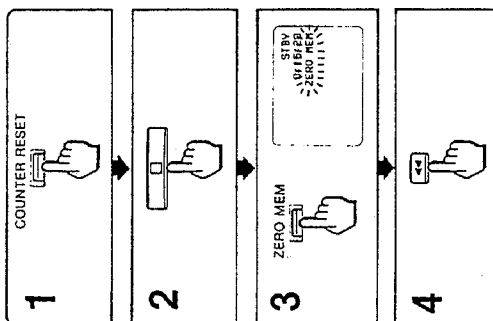
To Index the Whole Tape

Press the COUNTER RESET button at the beginning of the tape so that the counter shows "0:00.00". By noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
- The counter does not operate for a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast-forward and rewind operations.
- There will be also a time lag of several seconds when the tape recorded in LP and SP modes mixed or the tape having a blank portion between the recorded portions in played back.

T



82

- 1 During recording or playback, press the COUNTER RESET button at the point you later want to locate.
- 2 Press the $\square$ button when the recording or playback has finished.
- 3 Press the ZERO MEM button. The "ZERO MEM" indicator will blink in the display window.
- 4 Press the $\leftarrow$ or $\rightarrow$ button. The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

Notes

- The ZERO MEM button does not function during recording or playback mode. Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

Tape Editing

To edit a home movie tape, you will need another VCR or another video camera recorder.

To Edit from Another VCR to this Unit

- 1 While pressing the small button, set the POWER switch on this unit to VTR and turn on the other VCR.
- 2 Start playback on another VCR.
- 3 Slide the $\bullet$ REC switch on this unit.

To Edit from this Unit to Another VCR

- 1 While pressing the small button, set the POWER switch on this unit to VTR and turn on the other VCR.
- 2 Slide the EDIT switch on this unit in the direction of the arrow (ON).
- 3 Set the input selector on the VCR to LINE.
- 4 Press the $\square$ button on this unit during playback at the point where you want to start recording.
- 5 Press the record button on the other VCR, pressing the $\square$ button.
- 6 Release the $\square$ buttons on both units. Recording will start.

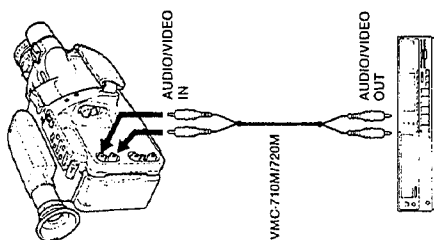
When the VCR to be used is a stereo type, use the VMC-910MS/920MS connecting cord.

After editing, turn off both units and be sure to slide the EDIT switch in the reversed direction to the arrow (OFF).

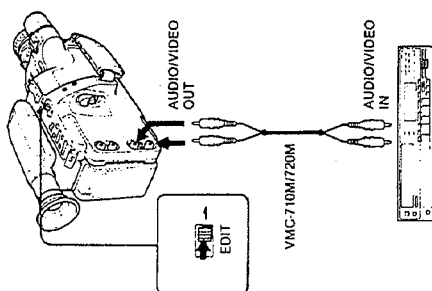
To cut off an unnecessary portion
Press the $\square$ button on the recorder at the beginning of the unnecessary portion. Release it where you want to resume recording.

Function of the EDIT switch
Slide this switch in the direction of the arrow (ON) whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer. When recording or playing back normally, keep this switch in the reversed direction to the arrow (OFF).

U-1



U-2



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Hints for Better Shooting

Precautions for using lights

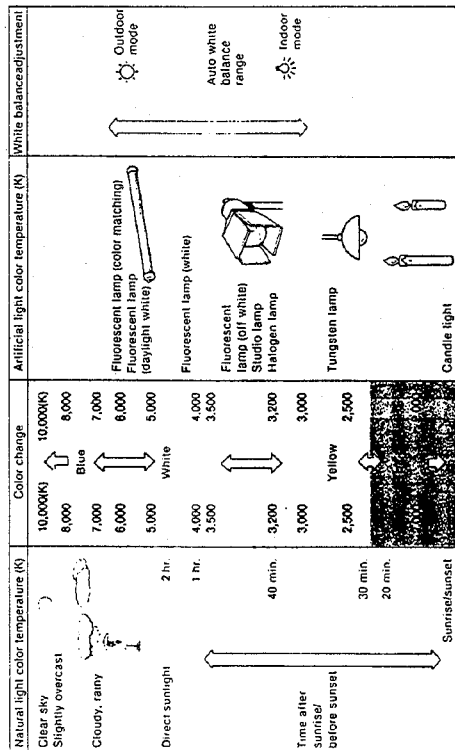
Do not point the light at the recorder body. Instead, make sure that it is pointed parallel to the camera or away from it. Be especially careful with lights attached to the accessory shoe. The high heat from the lights pointed at the camera body can warp the cabinet.

For detailed instructions on proper use of lights, carefully read the instruction manuals that accompany them.

Hints for Better Shooting

Color temperature — how it effects white balance adjustment

If the temperature of an object continues to increase, it will eventually begin giving off light. At this time, there is a fixed relationship between the object's temperature and its "light color." The temperature of the object radiating the light is expressed in absolute temperature (K). This is also known as the color temperature, which in turn stands for "light color." As color temperature increases, the light color changes from red to yellow to white to blue.



Brightness Levels

The single greatest influence on picture quality is the brightness level. Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording.

Unit: lux	
100,000	Snow covered mountains
10,000	Sandy beach, clear day in summer
1,000	Clear day, mid-day (100,000)
500	Clear day, mid-afternoon (35,000)
300	Overcast day, mid-day (12,000)
100	Overcast day, one hour after sunset (2,000)
10	Office by fluorescent lamp
	Window near window (1,000)
	Clear day, one hour before sunset (1,000)
	Department store counter (500-700)
	Station wicket (650)
	Office lit by fluorescent lamp
	Room lit by 20 W fluorescent lamp (500)
	Subway station platform (300)
	Arcade at night (150-200)
	Theater lobby (15-20)
	Candle light (10-15)

Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit, on the surface or the tape or on the lens. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

Moisture is present inside the unit when: [W-1]

- The [L] indicator blinks inside the viewfinder.
No function except for cassette ejection will work.

Eject the cassette if present, and turn off the unit and leave it with the cassette holder open at least for one hour.

The unit can be used again if the [L] indicator does not appear when the power is turned on again.

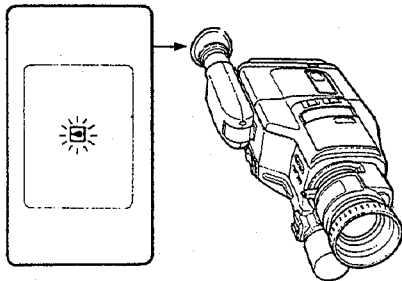
If moisture is present on the surface of the tape [W-2]

When the tape is inserted and a tape transport button is pressed, the [L] indicator blinks inside the viewfinder. No function except for cassette ejection will work.

Eject the cassette and let the unit and the cassette sit at least for one hour.
The cassette can be used again if the [L] indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condensation occurs on the lens
There are no caution indicators, but the lens becomes dim. Turn off the power and leave the unit unused at least for one hour.

[W-1]



[W-2]



Using Your Recorder Abroad

Each country has special TV color broadcast and electricity systems. Before using your recorder abroad, check the following points.

Differences in color systems

If you prepare fully charged battery packs and the AC power adaptor which can be used in all areas with the local power supply of 100V - 240V, you can use your recorder in any country. You can monitor the playback picture on the viewfinder screen. However, to monitor the playback picture on a TV, the TV must be based on the NTSC system and have the video/audio inputs.

NTSC system countries

Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

SECAM system countries

Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, the Soviet Union, etc.

Using Your Recorder Abroad

Differences in cassette tapes
There are two formats for 8 mm video recording, NTSC and PAL. Video cassette tapes are made to correspond to the respective formats. Use NTSC format cassette tape for the CCD-F45. You will find "P5" on the package of the cassette. In some countries, however, only PAL format cassette tape with "P5" on the package is available. In this case, the standard recording times stipulated on the cassette are different from the actual recording time.
For your reference to the recording times of NTSC and PAL format cassettes, see below.

NTSC cassette	
Cassette	Recording time SP mode
P6-15	15 min.
P6-30	30 min.
P6-60	60 min.
P6-90	90 min.
P6-120	120 min.

PAL cassette	
Cassette	Recording time SP mode
P5-15	22 min.
P5-30	43 min.
P5-60	84 min.
P5-90	126 min.

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Trouble Indicators

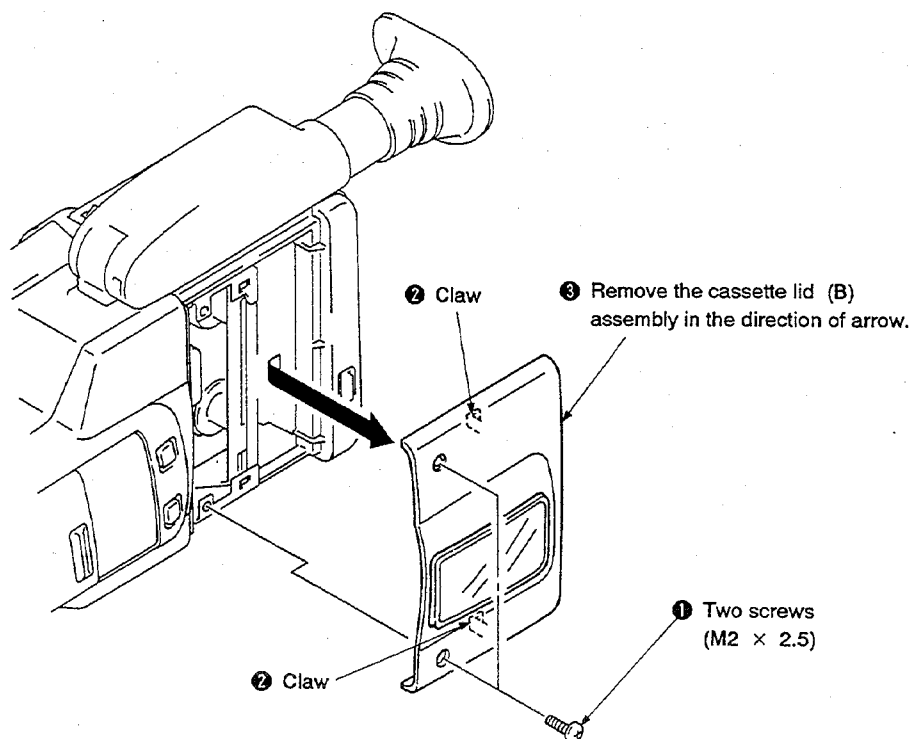
○ when the indicator appears ☐ slow blinking ☐ fast blinking

Cause	Position of the POWER switch		Indicator	
	VTR	CAMERA	Indicator to be shown inside the viewfinder	Camera recording/ battery lamp
The battery is fully exhausted.	○	○		
The battery is weak.	○	○		
The tape is at its end.		○		
No cassette is inserted.		○		
The tab on the cassette is out.		○		
Moisture has condensed inside the unit.	○	○		
The gap of the head is clogged.	○	○		
Other troubles	○	○		
The lithium battery is fully exhausted		○	AM12:00:00 (5 seconds)	
			JAN. 1 1989 AM12:00:00	
The lithium battery is weak		○	Time (5 seconds)	
			Normal indication for the operation	

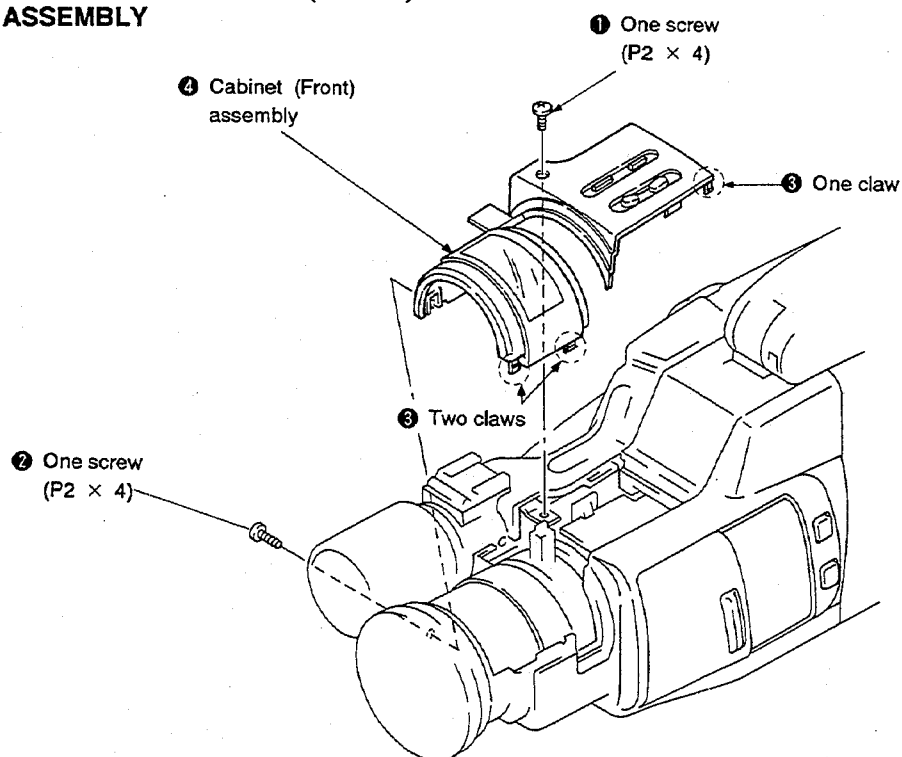
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SECTION 2 DISASSEMBLY

2-1. REMOVAL OF CASSETTE LID (B) ASSEMBLY

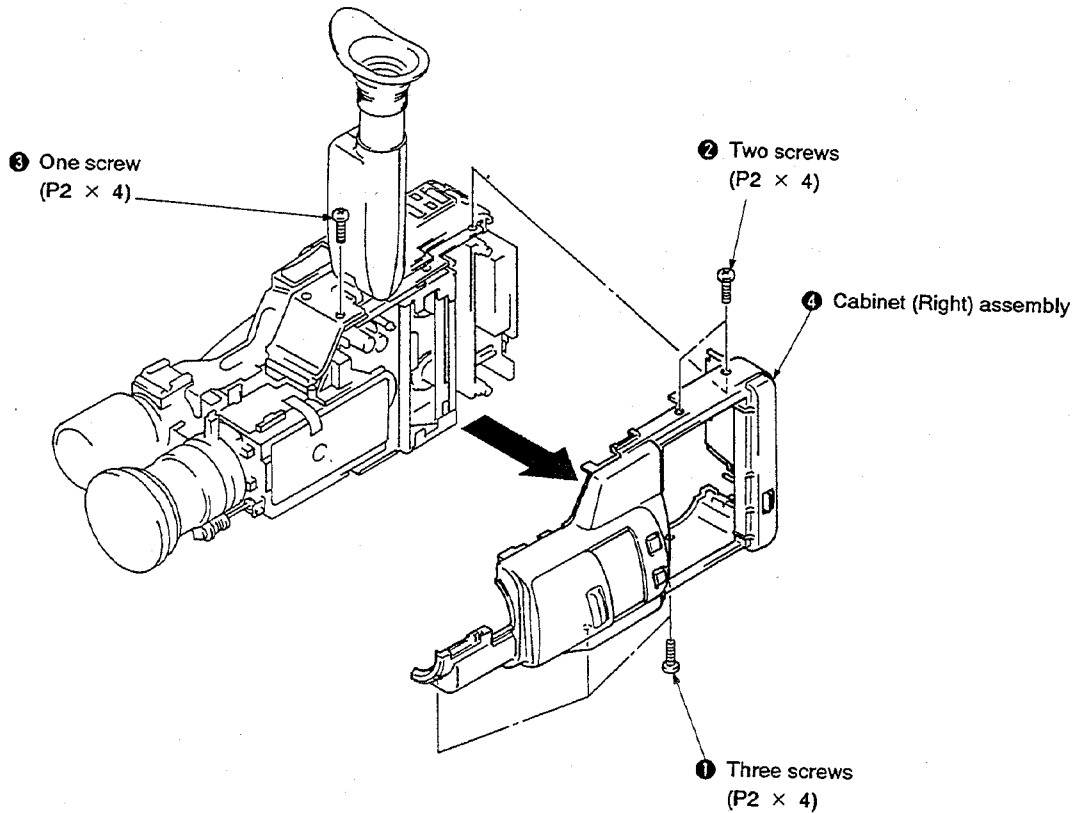


2-2. REMOVAL OF CABINET (FRONT) ASSEMBLY

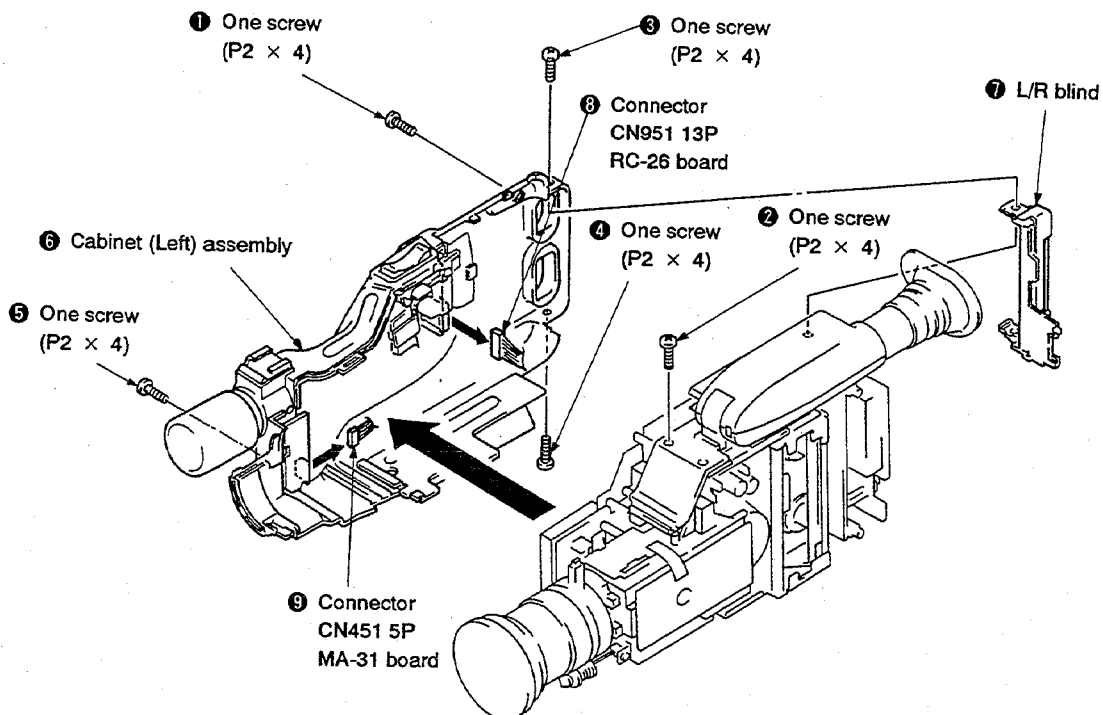


2-3. REMOVAL OF CABINET (RIGHT) ASSEMBLY

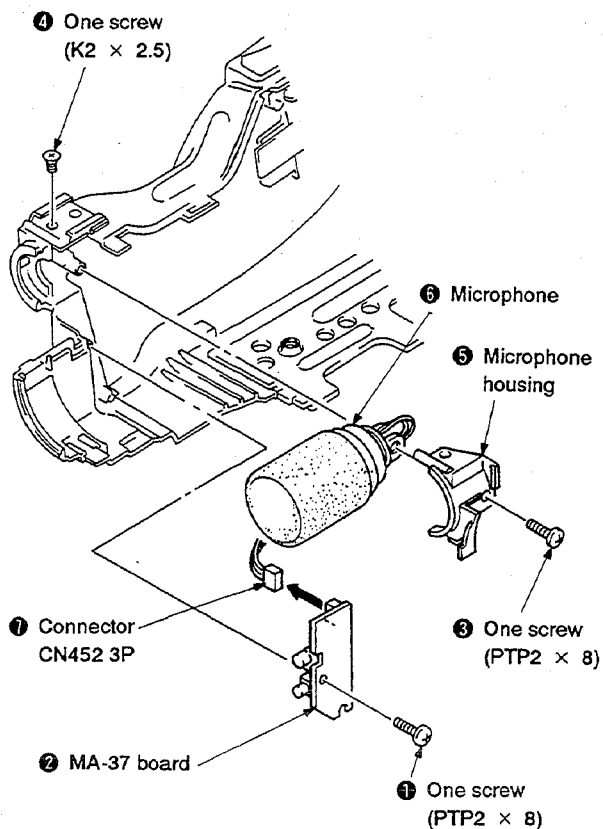
Note: Perform this servicing with EVF raise as the figure below.



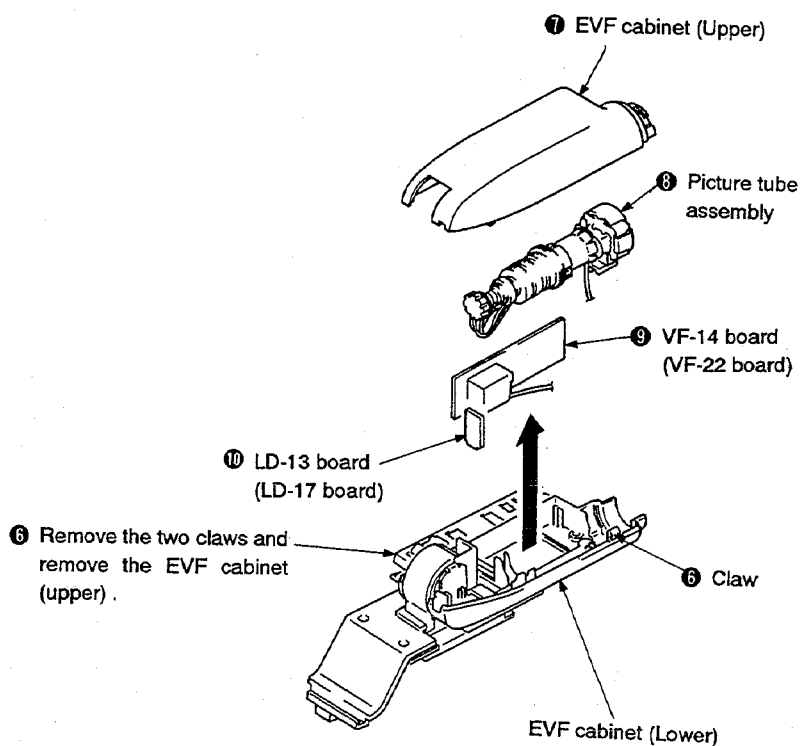
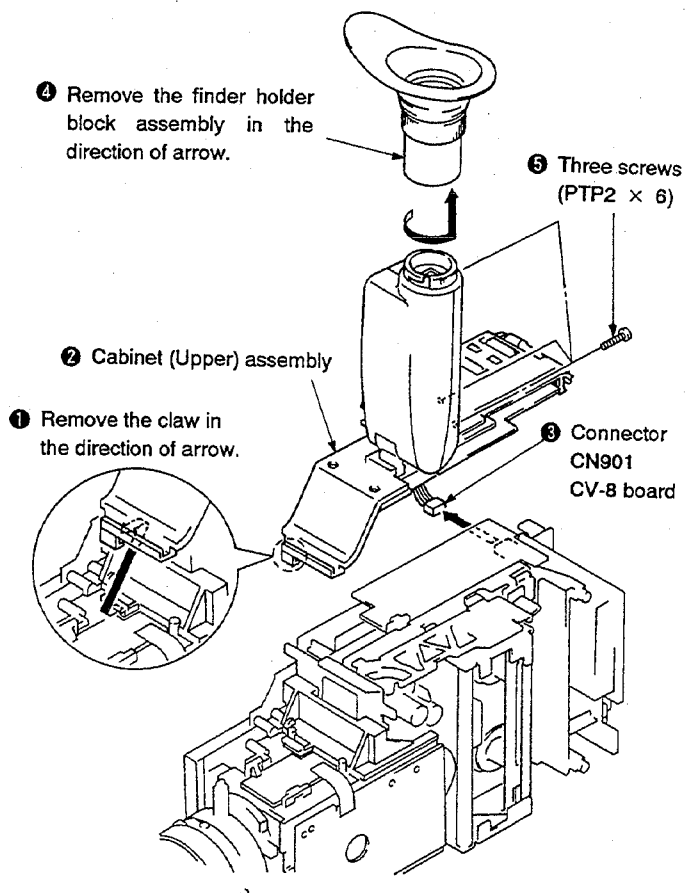
2-4. REMOVAL OF CABINET (LEFT) ASSEMBLY



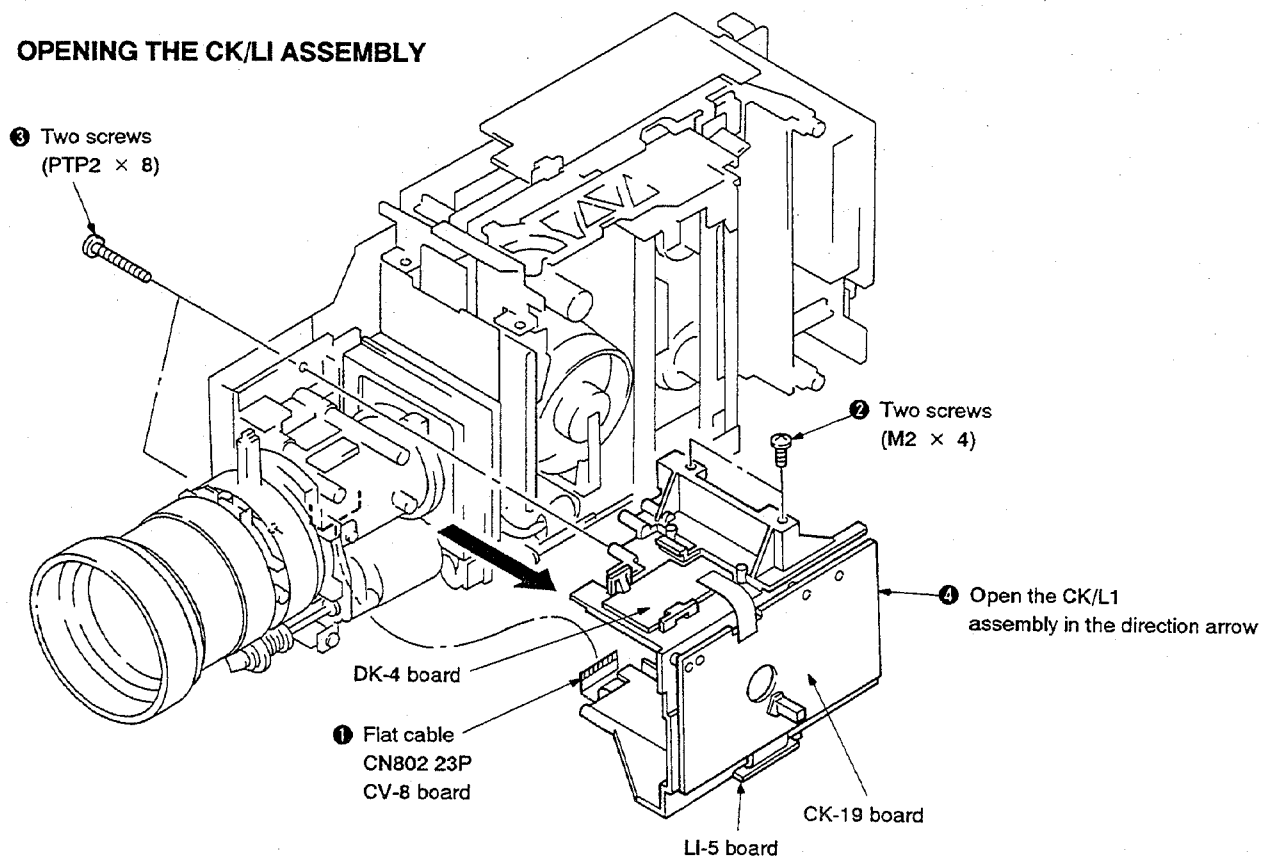
2-5. REMOVAL OF MICROPHONE



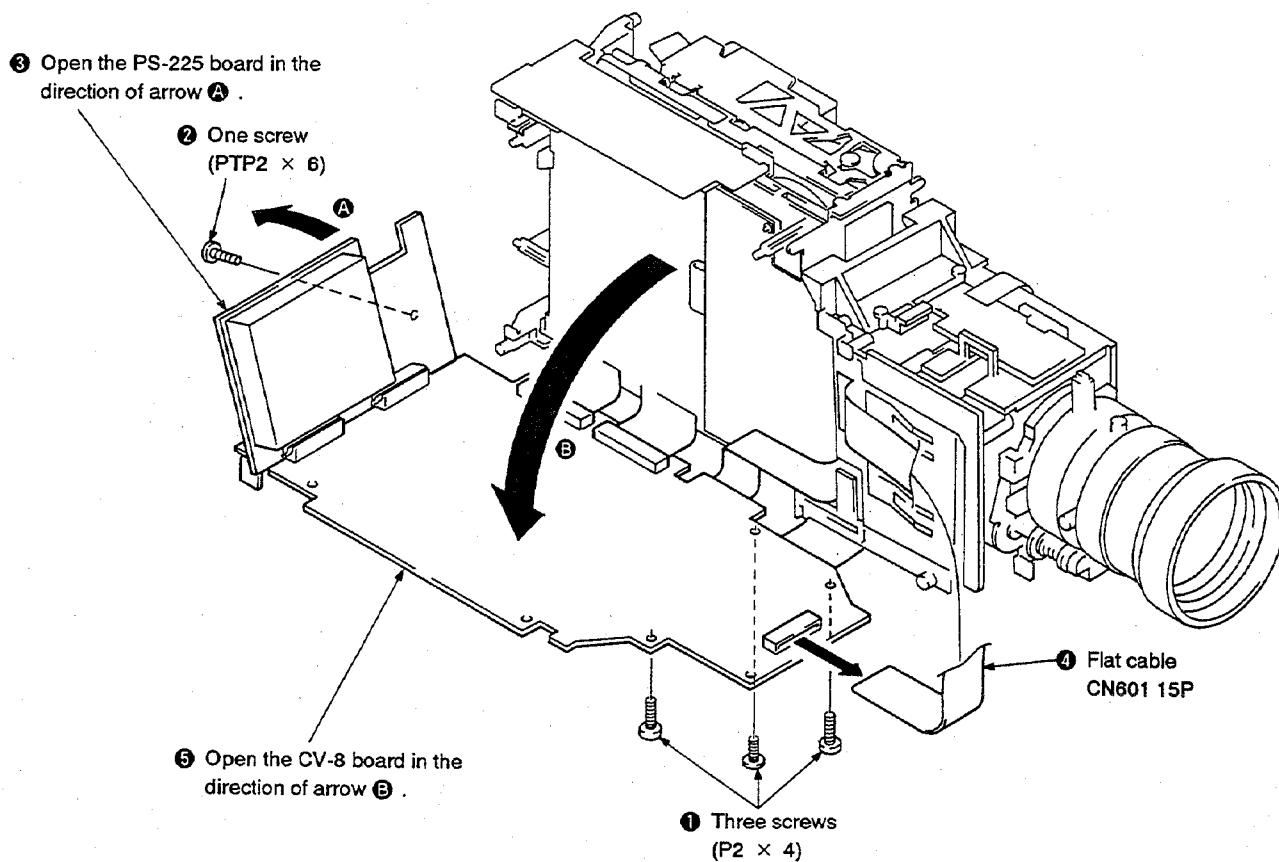
2-6. REMOVAL OF CABINET (UPPER) ASSEMBLY AND EVF



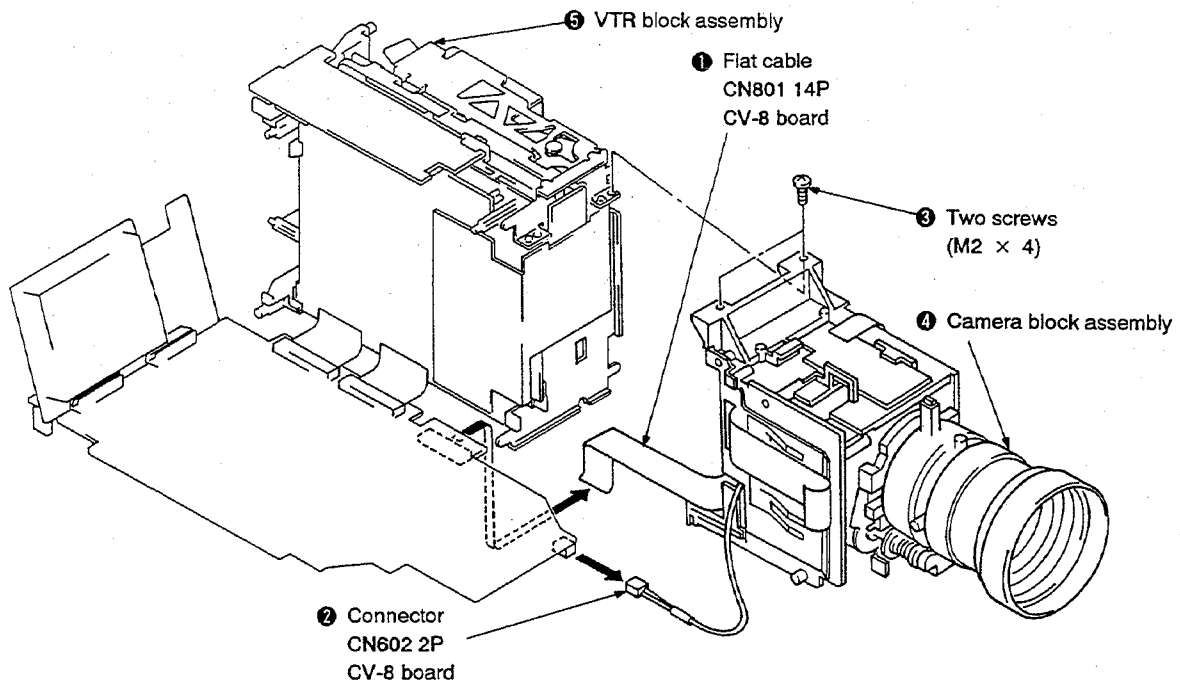
2-7. OPENING THE CK/LI ASSEMBLY



2-8. OPENING THE PS-225 AND CV-8 BOARDS

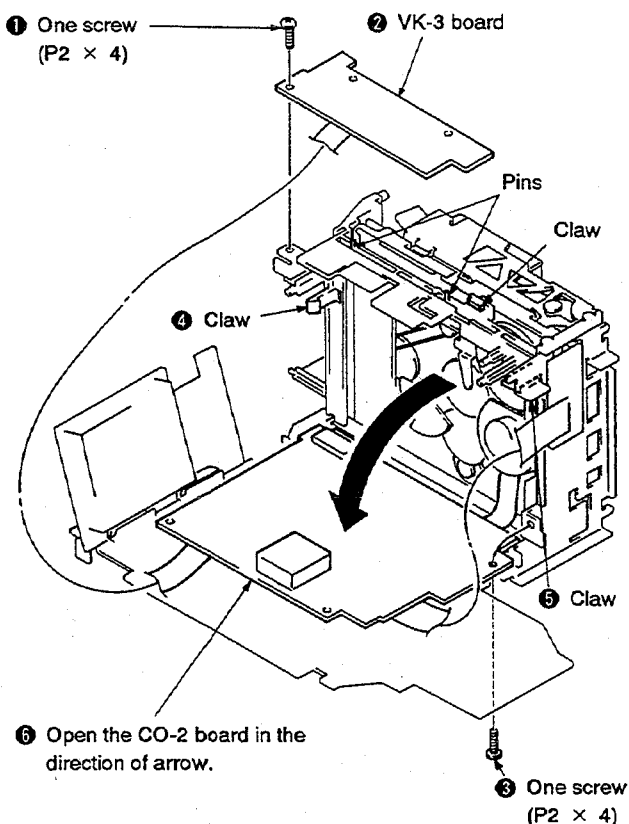


2-9. SEPARATING THE CAMERA AND VTR BLOCKS

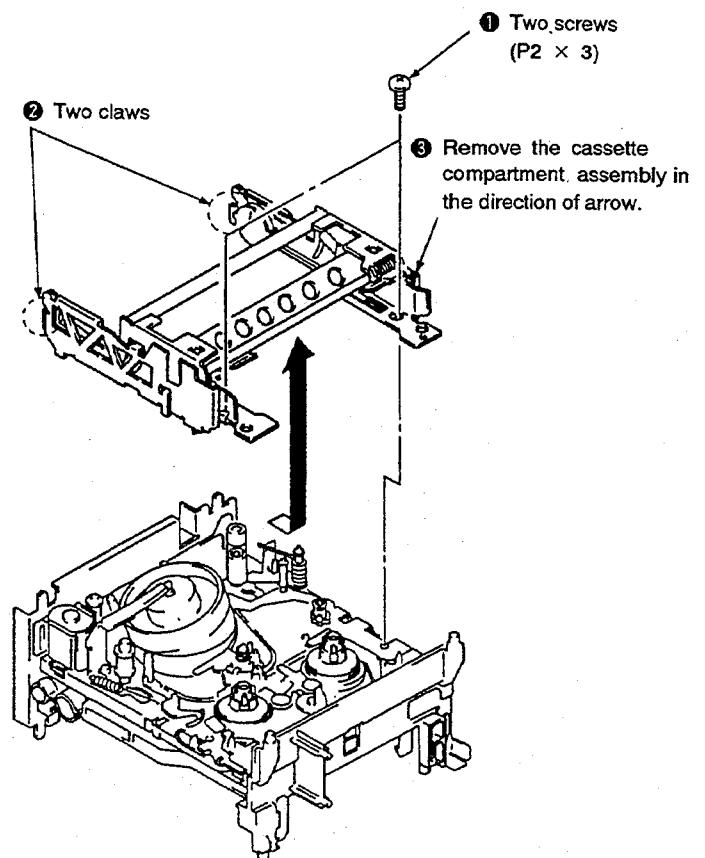


2-10. OPENING THE CO-2 AND VK-3 BOARDS

Notes: 1) Pay attention to two pins and a claw when removing the VK-3 board.
2) Care for the FE shield which is adhered to the RP amplifier shield case with a double coated tape.

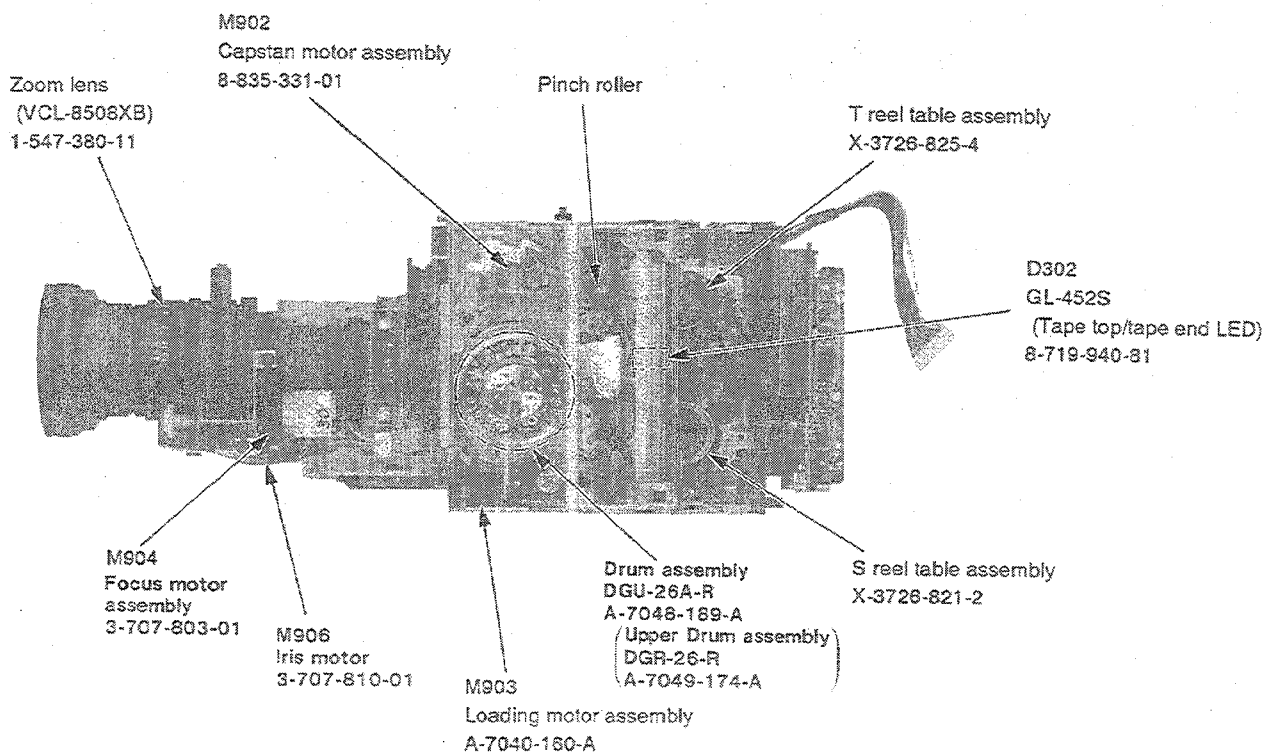


2-11. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

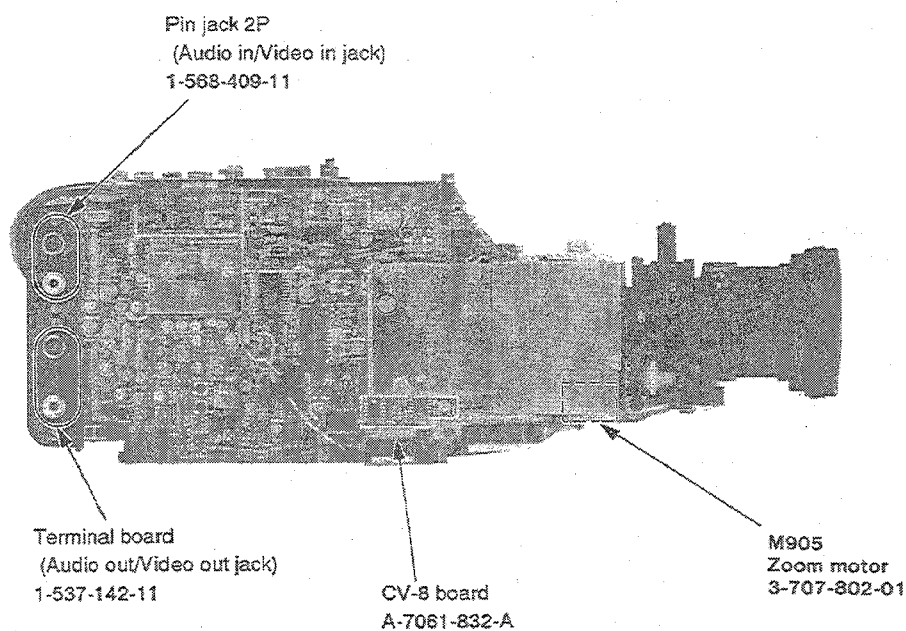


2-12. INTERNAL VIEW

– Right Side –

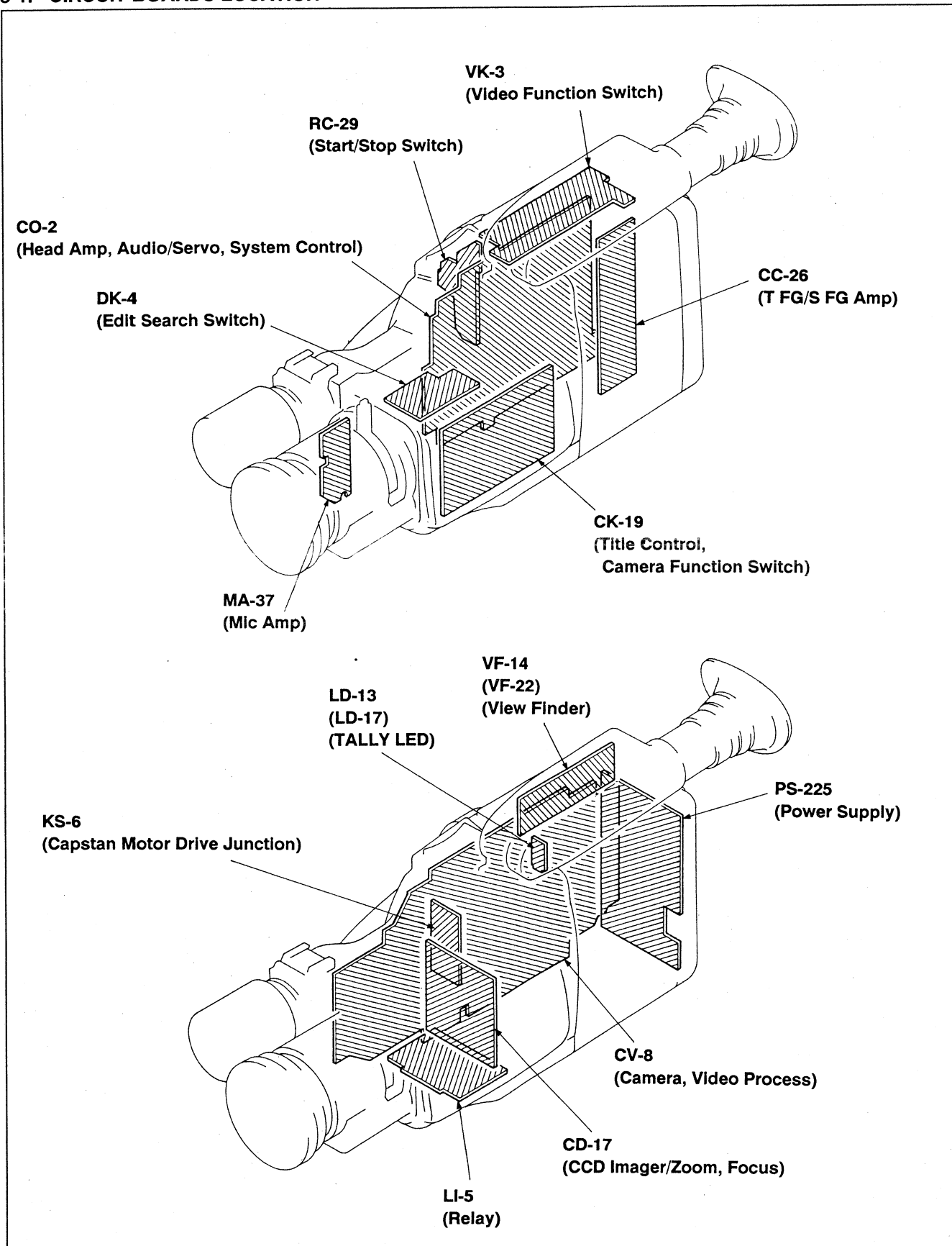


– Left Side –

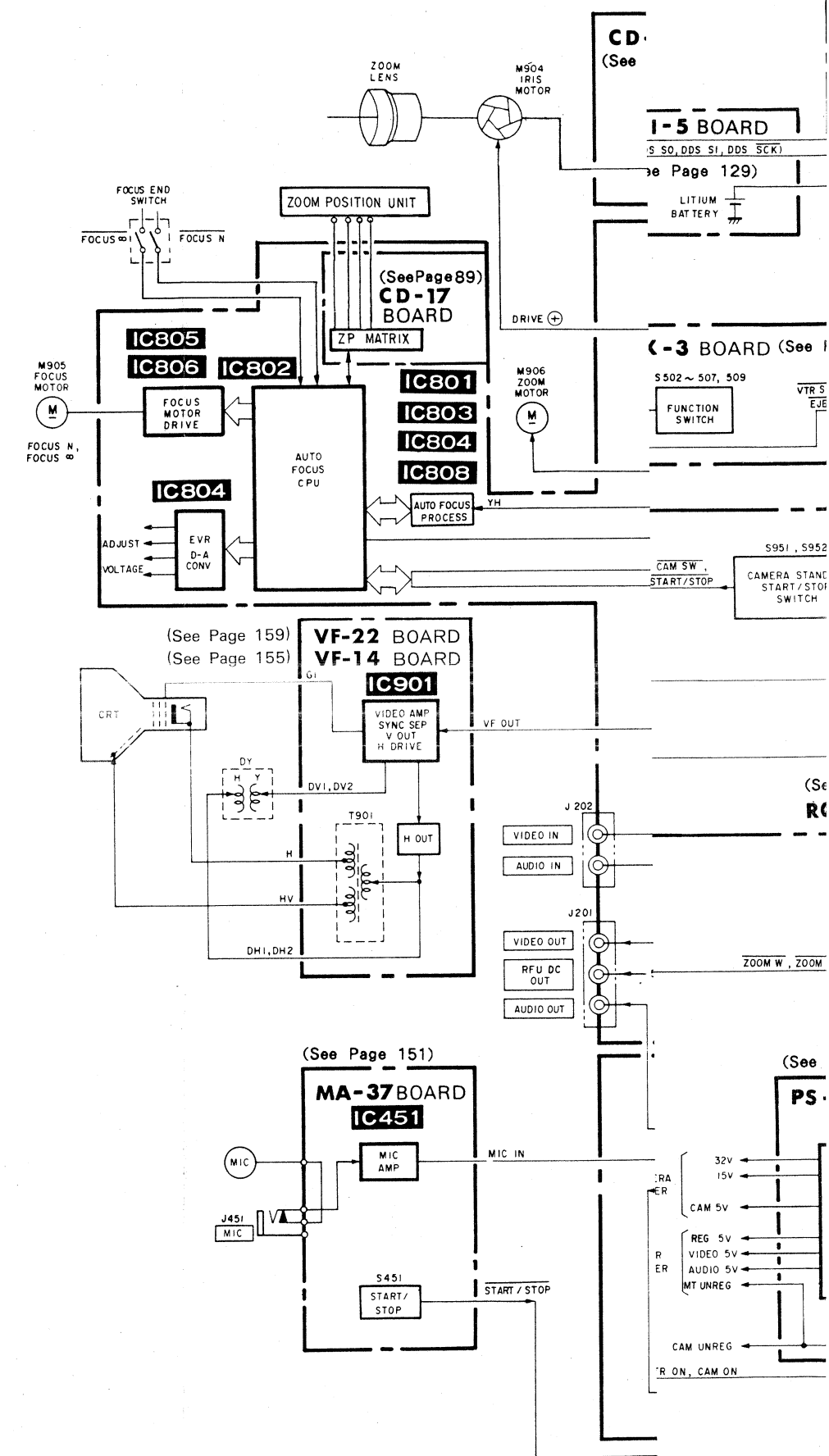


SECTION 3 DIAGRAMS

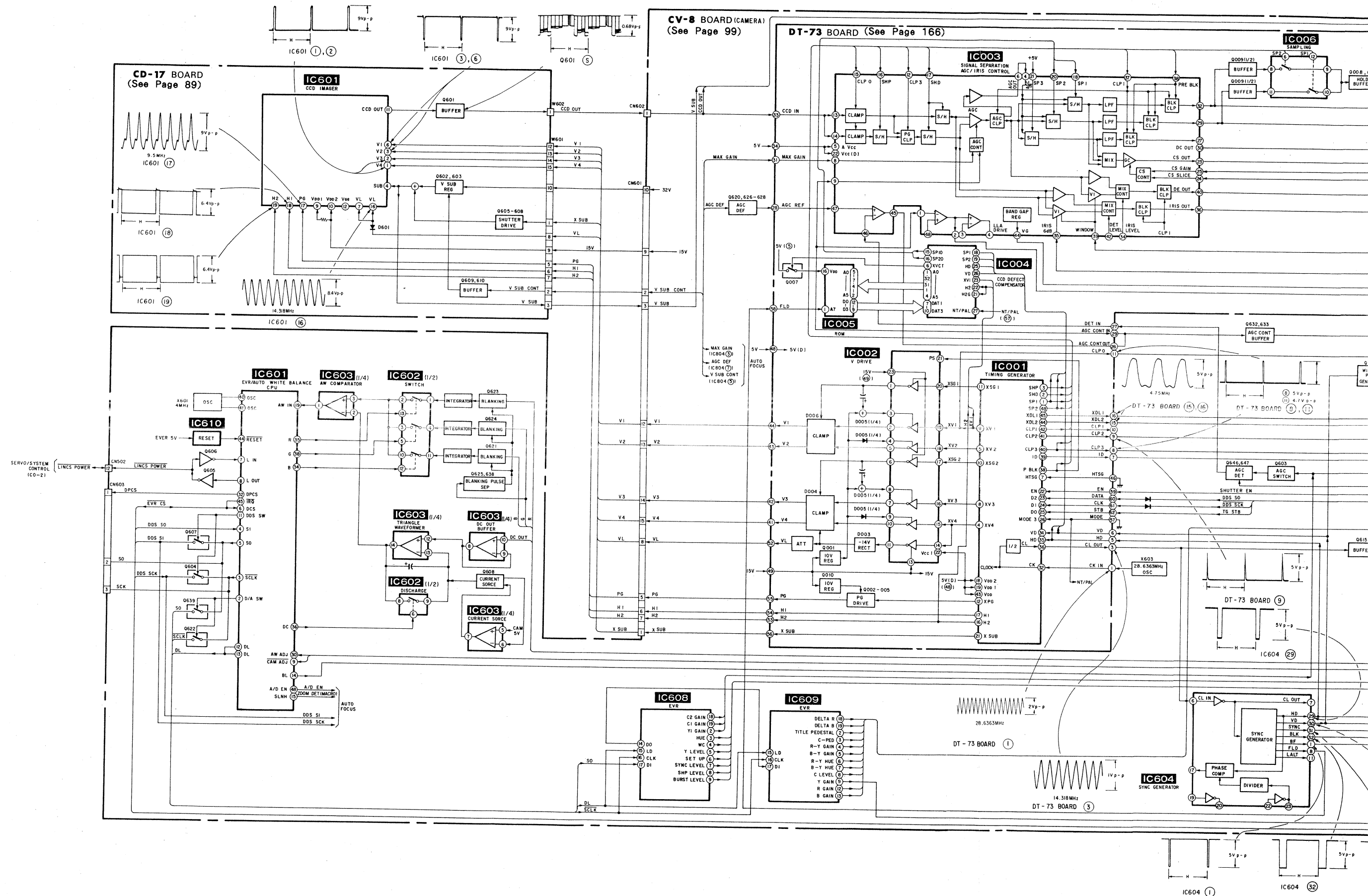
3-1. CIRCUIT BOARDS LOCATION

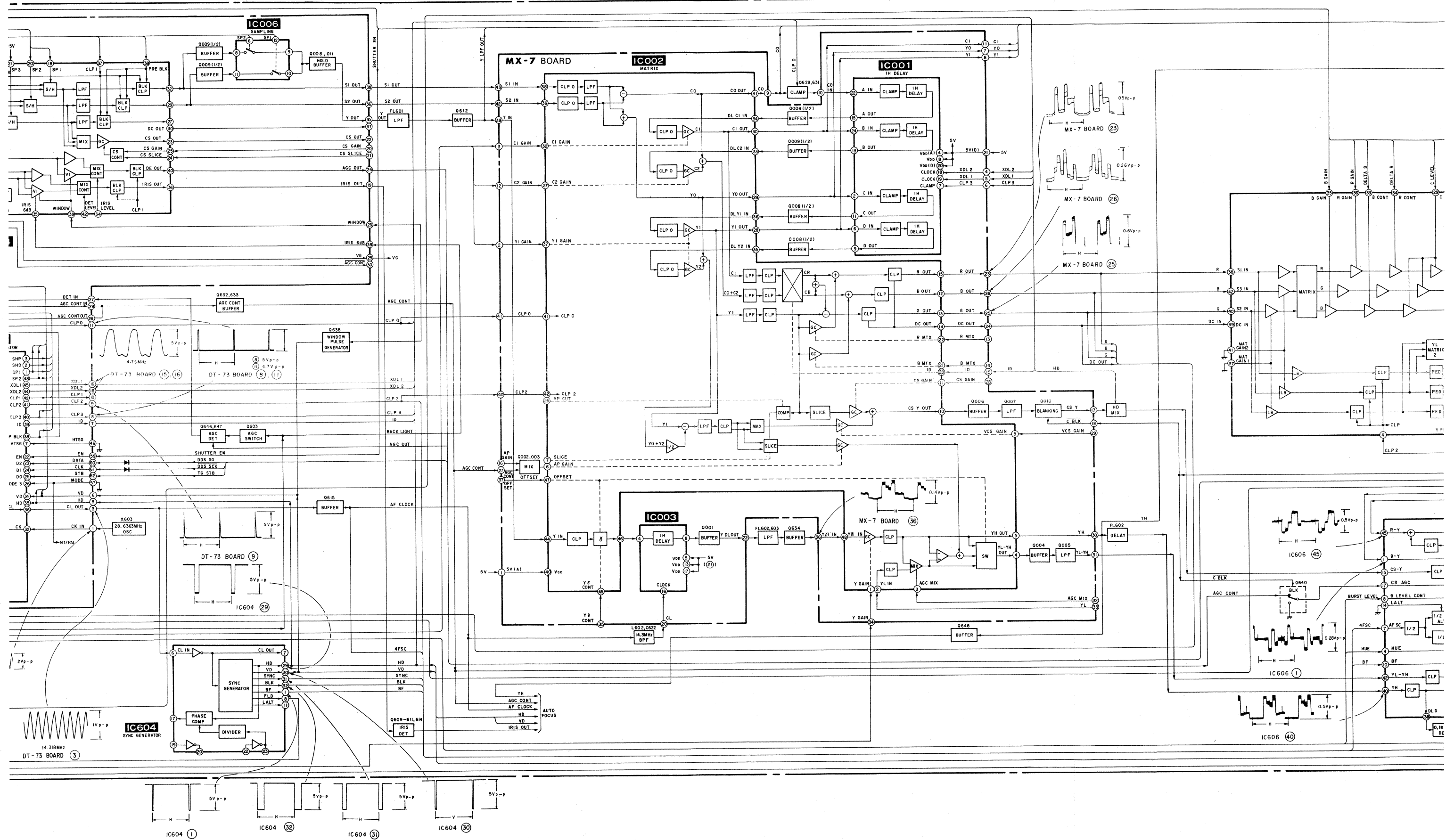


3-2. OVERALL BLOCK DIAGRAM

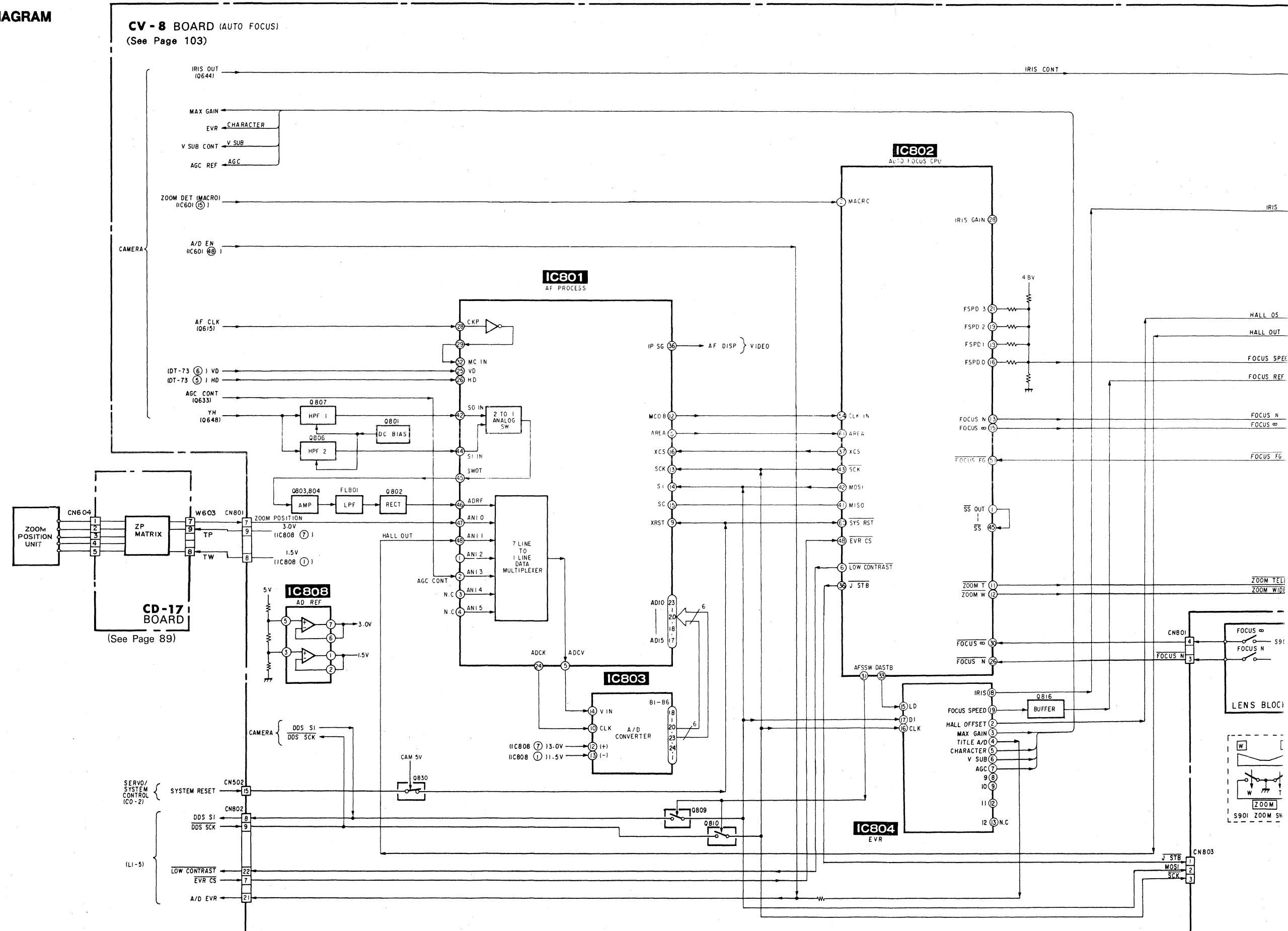


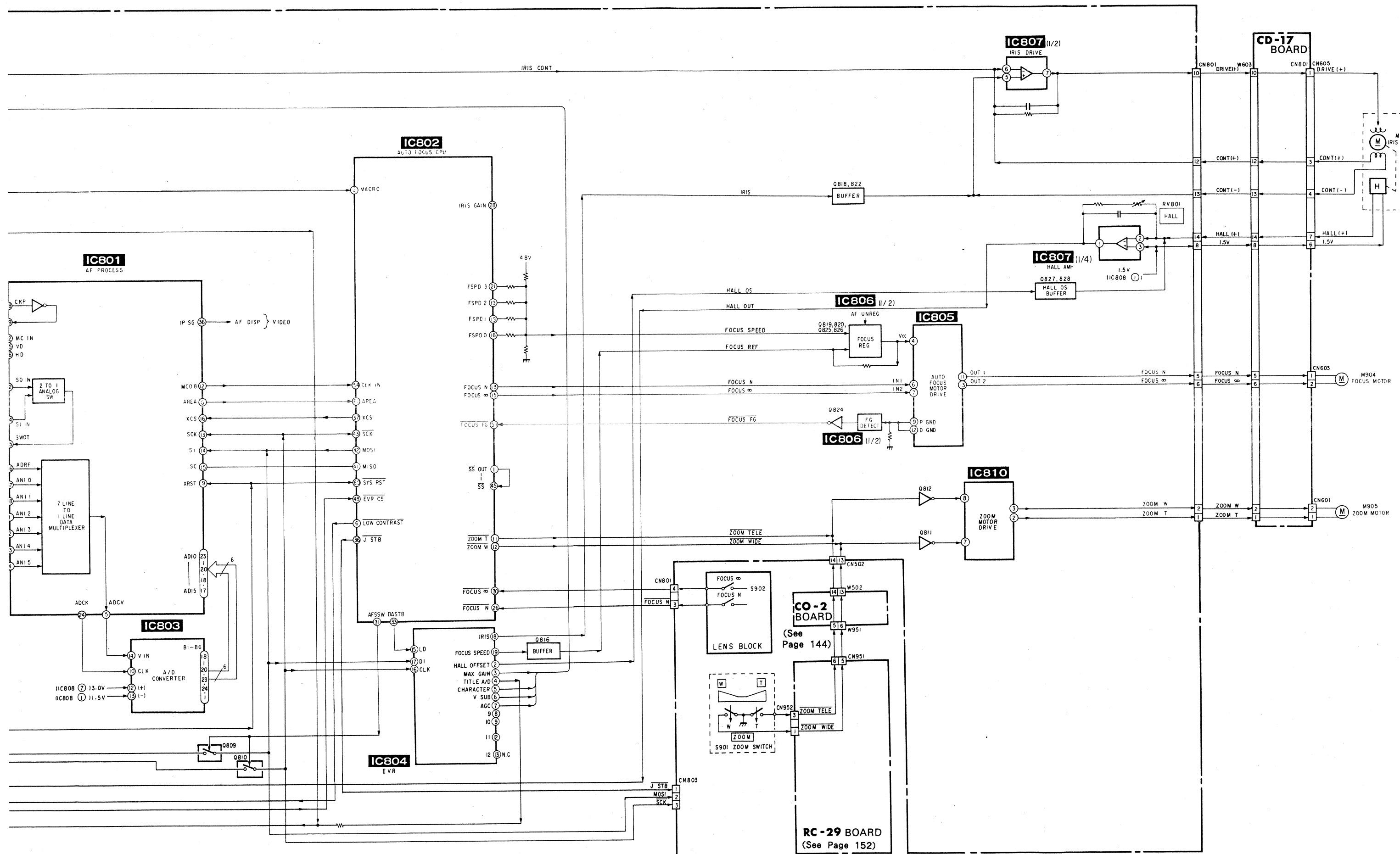
3-3. CAMERA BLOCK DIAGRAM





3-4. AUTO FOCUS BLOCK DIAGRAM





3-5. CAMERA FUNCTIUN BLOCK DIAGRAM

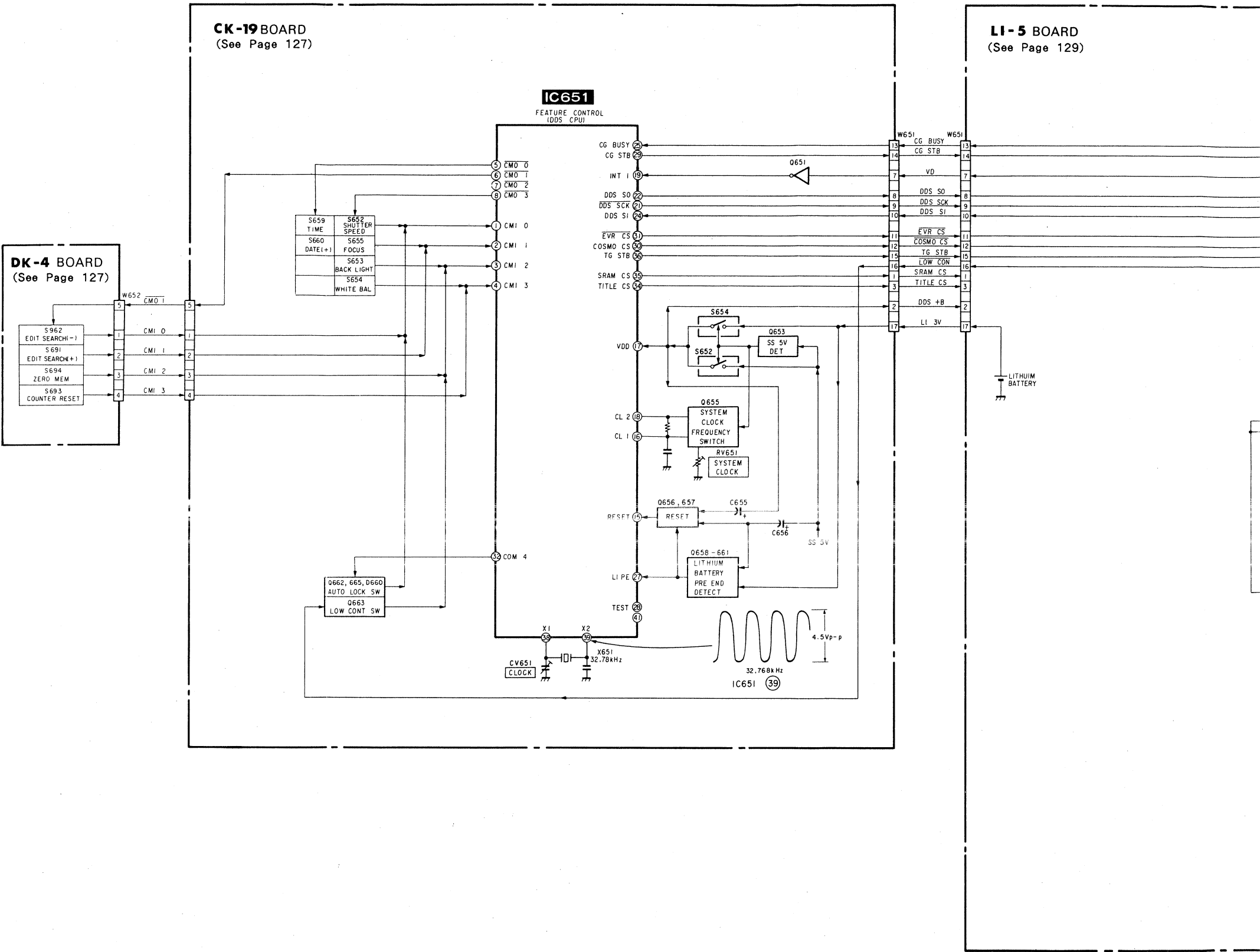
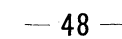
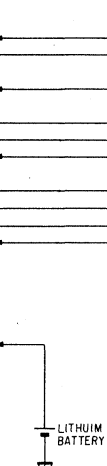
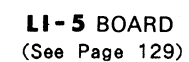
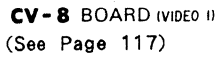


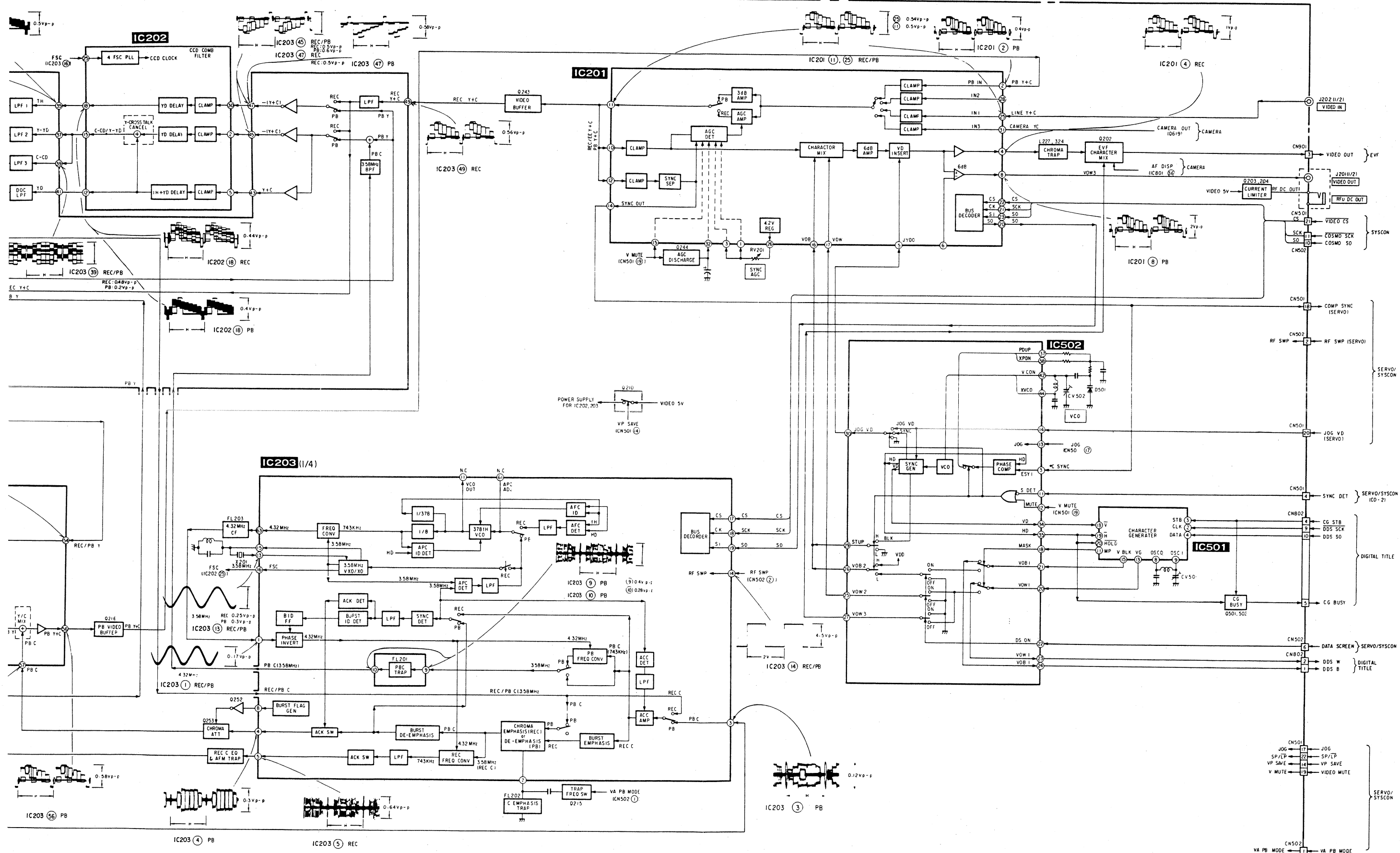
Diagram illustrating the connections between the 5659/5652 control panel and the 5650 control panel:

- 5659 TIME connects to 5650 CMO 0.
- 5652 SHUTTER SPEED connects to 5650 CMO 1.
- 5660 DATE (+) connects to 5650 CMO 2.
- 5655 FOCUS connects to 5650 CMO 3.
- 5653 BACK LIGHT connects to 5650 CMO 4.
- 5654 WHITE BAL connects to 5650 CMO 4.

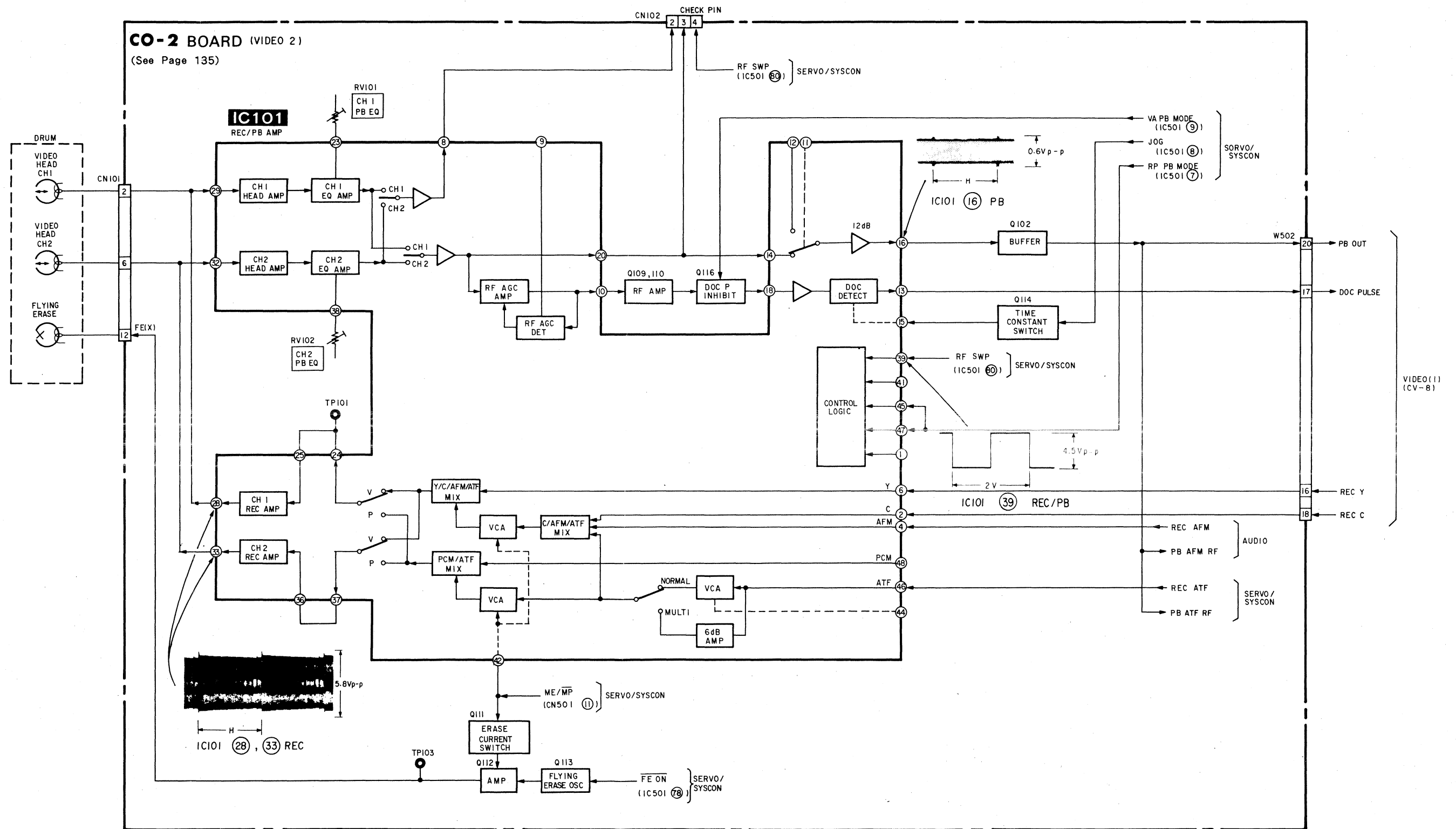


3-6. VIDEO BLOCK DIAGRAM(1)

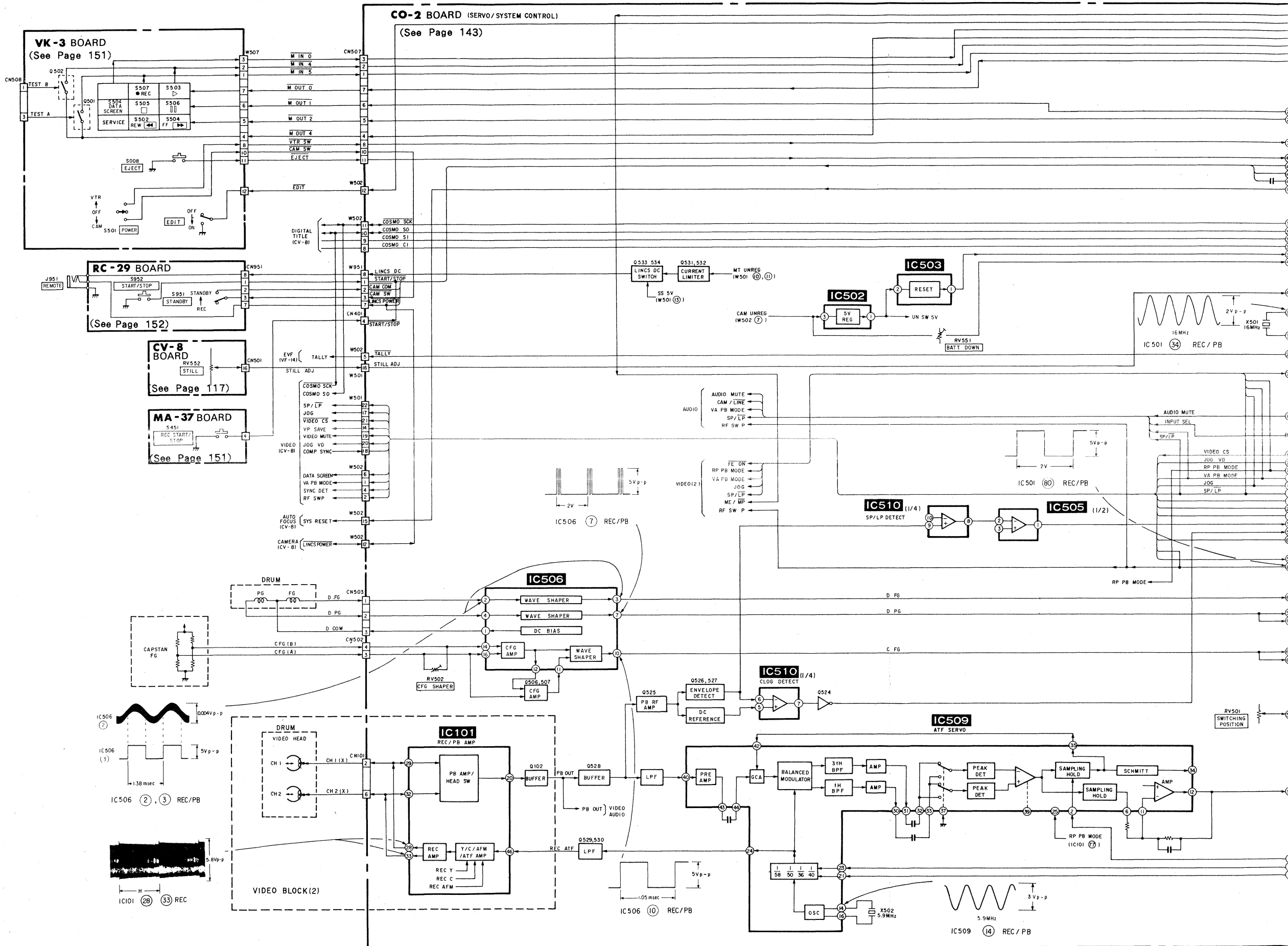


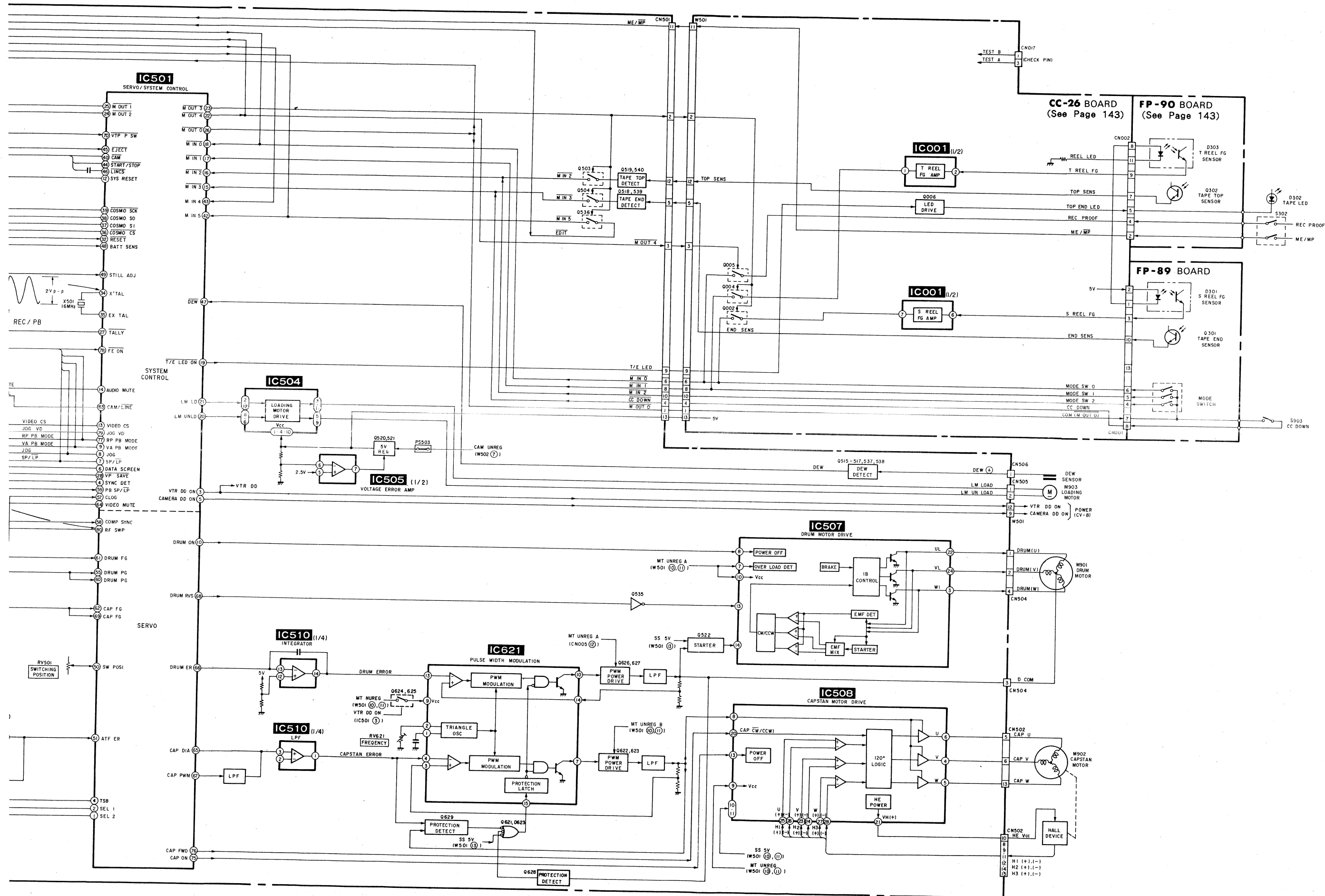


3-7. VIDEO BLOCK DIAGRAM(2)



3-8. SERVO, SYSTEM CONTROL BLOCK DIAGRAM





3-9. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of the following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer μPD7508BGB
- EVR microcomputer MC68HC05N4FU
- AF microcomputer MC68HC05C4FU

3-9-1. Mode/Mechanism Control Microcomputer CXP80116 (IC501 on CO-2 Board)

1. Function description

- 1) Power ON/OFF control
- 2) Key matrix read
(Playback, record, fast-forward, rewind, pause, stop, data screen)
- 3) Reading of other keys
(Power (camera/off/video), cassette eject)
- 4) Servos
- 5) Loading motor control
- 6) Error detection
 - Battery end/pre-end
 - Tape end
 - No cassette
 - Erasure prevention
 - DEW (condensation)
 - PAUSE release
 - CLOG (jamming)
 - L. motor emergency
 - Drum rotation
 - Drum phase
 - Reel rotation
 - Capstan rotation
 - Drum/capstan start
- 6) H.M.S. counter
- 7) JOG VD insertion
- 8) Execution of various modes

2. Abbreviated specifications

- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microcomputer mode
- ROM: 16 kbytes
- RAM: 352 kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3-9-2. DDS Microcomputer μPD7508BGB (IC651 on CK-19 Board)

1. Function description

- 1) Internal data communication control
- 2) Date/time measurement
- 3) LCD indication
- 4) Reading of key matrix
(White balance, electronic shutter, edit search +/–, auto-lock, focus mode, counter reset, zero memory, title, store, color/mode, back light compensation, date/forward, time/set)

2. Operation modes

As shown in the table below, the operation mode is determined according to the position of the power switch (camera/off/video) and whether or not there is a main battery.

Mode	Main Battery	Power Switch	Microcomputer Power	Clock Mode	Main Functions
BACK UP	No	Camera/off/video	Lithium battery	500 ms intermittent oscillation	• Backup of title and tape counter data • Clock count operation
	Yes	Off			
VTR ON	Yes	Video	SS 5V (main battery)	Continuous oscillation	• Serial communication with EVR and mode/mechanism control micro-computer • Indication to EVF • Acceptance of zero memory and counter reset keys
CAM ON	Yes	Camera	SS 5V (main battery)	Continuous oscillation	• VTR ON functions + all camera features • Indication control for white balance, focus, titles, electronic shutter, etc.

3-9-3. EVR Microcomputer MC68HC05N4FU (IC601 on CV-8 Board)

1. Function description

- 1) EVR control
- 2) Auto white balance control
- 3) Electronic shutter

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3-9-4. AF Microcomputer MC68HC05C4FU (IC802 on CV-8 Board)

1. Function description

- 1) AF control
- 2) Power focus
- 3) Zoom motor drive

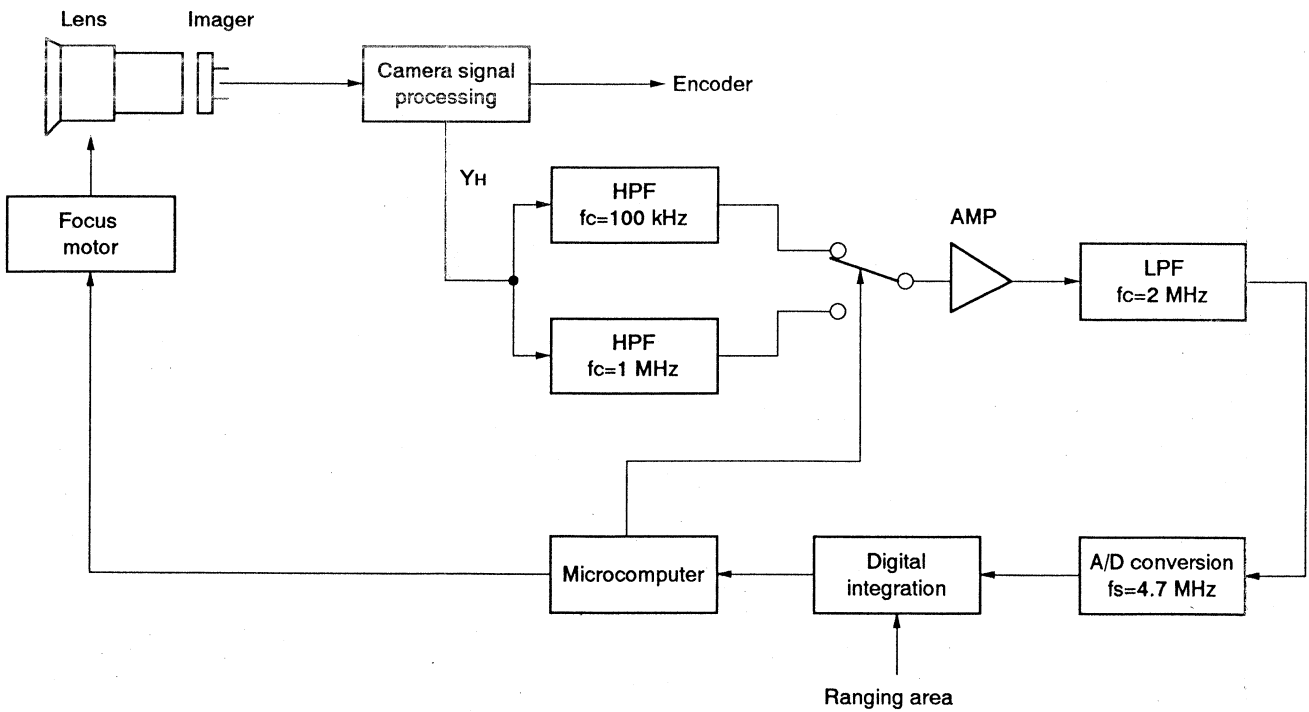
2. Auto focus system of this unit
(A-AF: Image processing system)

The high frequency components of the video signal (actually luminance signal) are microcomputer processed by TCL without using external sensors to control the focus.

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance signal Y, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and the focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases



3-9-5. Mode/Mechanism Control — Video, Audio Block Interface

Signal	I/O	Pin No.	STOP	FF	REW	CUE	REVIEW	PB	PB · PAUSE	REC	REC · PAUSE
ME/MP	O	Pin ⑪ of CN501 on CO-2 board	*1	*1	*1	*1	*1	*1	*1	*1	*1
SP/LP	O	Pin ⑦ of IC501 on CO-2 board	H	H	H	*2	*2	*2	*2	H	H
JOG	O	Pin ⑧ of IC501 on CO-2 board	L	L	L	H	H	L	H	L	L
VA PB MODE	O	Pin ⑨ of IC501 on CO-2 board	L	L	L	H	H	H	H	L	L
VIDEO CS	O	Pin ⑬ of IC501 on CO-2 board	*3	*3	*3	*3	*3	*3	*3	*3	*3
AUDIO MUTE	O	Pin ⑭ of IC501 on CO-2 board	L	L	L	H	H	L	H	L	L
VP SAVE *16	O	Pin ⑳ of IC501 on CO-2 board	H	H	L	L	L	L	L	L	H
SYNC DET *14	O	Pin ㉑ of IC501 on CO-2 board	*4	*4	*4	*5	*5	*5	*5	*4	*4
COSMO SO	O	Pin ㉒ of IC501 on CO-2 board	*6	*6	*6	*6	*6	*6	*6	*6	*6
COSMO SCK	O	Pin ㉓ of IC501 on CO-2 board	*7	*7	*7	*7	*7	*7	*7	*7	*7
CLOG	I	Pin ㉔ of IC501 on CO-2 board	H	*8	*8	*8	*8	*8	*8	H	H
COMP SYNC	I	Pin ㉕ of IC501 on CO-2 board	*9	*9	*9	*9	*9	*9	*9	*9	*9
PB SP/LP	I	Pin ㉖ of IC501 on CO-2 board	L	*10	*10	*10	*10	L	L	L	L
CAM/LINE	O	Pin ㉗ of IC501 on CO-2 board	*11	*11	*11	*11	*11	*11	*11	*11	*11
VIDEO MUTE *15	O	Pin ㉘ of IC501 on CO-2 board	L	L	L	L	L	L	L	L	L
RP PB MODE	O	Pin ㉙ of IC501 on CO-2 board	L	L	L	H	H	H	H	L	L
FE ON	O	Pin ㉚ of IC501 on CO-2 board	H	H	H	H	H	H	H	L	H
JOG VD	O	Pin ㉛ of IC501 on CO-2 board	L	L	L	*12	*12	L	*12	L	L
RF SWP	O	Pin ㉜ of IC501 on CO-2 board	H	*13	*13	*13	*13	*13	*13	*13	*13

- *1. "L" when using MP tape
- *2. According to recorded mode of PB tape (SP: "H", LP: "L")
- *3. Approx. 20 msec period "L" pulse. Chip select signal to video IC (IC201 and IC203 on CV-8 board)
- *4. "H" when video signals are input.
- *5. "H" when video signals are played back.
- *6. 1V period "L" pulse train
- *7. 1V period "L" pulse train
- *8. Video head clog: "H", Normally: "L"

- *9. Positive polarity composite sync signal
- *10. SP mode recorded tape: "H", LP mode recorded tape: "L"
- *11. "L" when the power switch is set to VIDEO position and "H" when CAMERA position.
- *12. 1V period "H" pulse
- *13. 2V period duty 50% pulse
- *14. Detects a composite sync signal input at pin ㉑ of IC501.
- *15. "H" when STOP to/from PB mode transition period.
- *16. This signal switches a power (on/off) of video circuit IC202 and IC203.

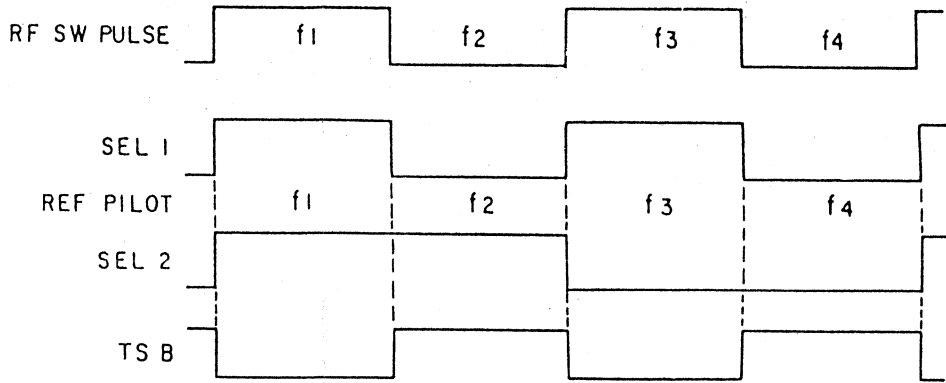
3-9-6. Mode/Mechanism Control — Servo Peripheral Circuit Interface

Signal	I/O	Pin No.	EJECTED	THREAD- ING	UN THREAD- ING	STOP	FF	REW	CUE	REVIEW	PB	PB • PAUSE	REC	REC • PAUSE
SEL 2 *17	O	Pin ① of IC501 on CO-2 board	L	L	L	L	H	H	*3	*3	*2	H	*1	H
SEL 1 *17	O	Pin ② of IC501 on CO-2 board	H	H	H	H	H	H	*3	*3	*2	L	*1	H
TS B *18	O	Pin ④ of IC501 on CO-2 board	L	L	L	L	L	L	*3	*3	*2	*16	*1	L
DRUM ON	O	Pin ⑩ of IC501 on CO-2 board	L	H	H	L	H	H	H	H	H	H	H	H
SW POSI	I	Pin ⑤ of IC501 on CO-2 board	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
ATF ERROR	I	Pin ⑤ of IC501 on CO-2 board	*6	*6	*6	*6	*7	*7	*7	*7	*7	*7	*6	*6
DRUM PG	I	Pins ⑤ and ⑥ of IC501 on CO-2 board	L	*8	*8	L	*8	*8	*8	*8	*8	*8	*8	*8
DRUM FG	I	Pin ⑥ of IC501 on CO-2 board	H	*9	*9	H	*9	*9	*9	*9	*9	*9	*9	*9
CAP FG	I	Pins ⑦ and ⑧ of IC501 on CO-2 board	H/L	PULSE	PULSE	H/L	*10	*10	*10	*10	*10	H/L	*10	H/L
CAP D/A	I	Pin ⑤ of IC501 on CO-2 board	L	*11	*11	L	*11	*11	*11	*11	*11	L	*11	L
DRUM D/A	O	Pin ⑥ of IC501 on CO-2 board	L	*12	*12	L	*12	*12	*12	*12	*12	*12	*12	*12
CAP PWM	O	Pin ⑦ of IC501 on CO-2 board	L	*13	*13	L	*13	*13	*13	*13	*13	L	*13	L
DRUM FWD/REV	O	Pin ⑧ of IC501 on CO-2 board	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14
CAP ON	O	Pin ⑨ of IC501 on CO-2 board	L	H	H	L	H	H	H	H	H	L	H	L
CAP FWD	O	Pin ⑩ of IC501 on CO-2 board	L	L	H	L	H	L	H	L	H	L	H	L
RF SWP	O	Pin ⑪ of IC501 on CO-2 board	H	*15	*15	H	*15	*15	*15	*15	*15	*15	*15	*15

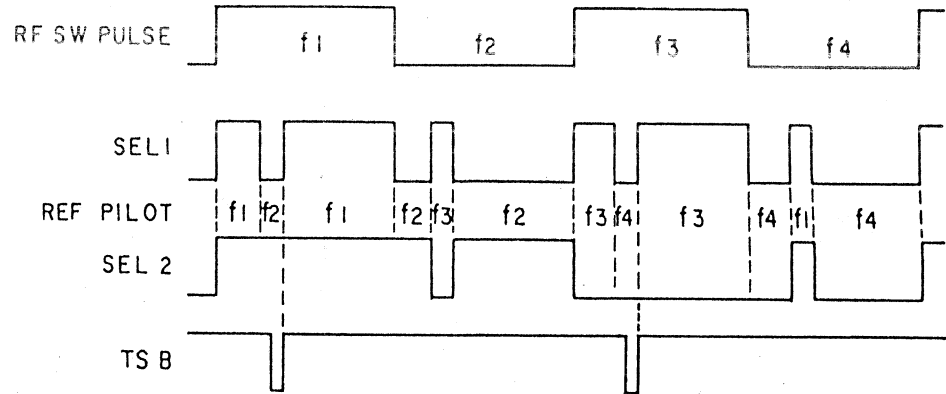
- *1. See timing chart 1.
- *2. See timing chart 2.
- *3. See timing chart 3.
- *4. 1V period "H" pulse
- *5. DC voltage set with RV501 (Switching position adjustment)
- *6. Approx. 2.3 Vdc constant
- *7. ATF error voltage
- *8. 2V period "H" pulse
- *9. 1.4 msec period pulse
- *10. Pulses of frequency in proportion to tape speed

- *11. "H" pulse output when rising or falling edges of the capstan, Normally: "HIZ"
- *12. 6 msec period PWM signal (tri-state) of "H", "L" and "HIZ" (2.5 Vdc)
- *13. 64 μ sec period PWM signal
- *14. Normally: "H"
- *15. 2V period duty 50% pulse
- *16. V period "L" pulse
- *17. ATF REF PILOT signal frequency (f1 to f4) selecting signal
- *18. ATF AGC timing control signal

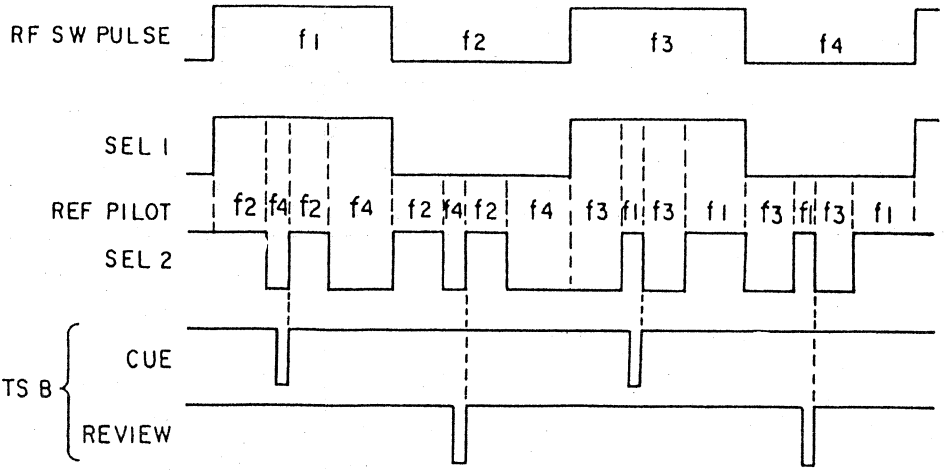
Timing chart 1 (REC)



Timing chart 2 (PB)



Timing chart 3 (CUE/REVIEW)



3-9-7. Mode/Mechanism Control — Mode/Mechanism Control Peripheral Circuit Interface

Signal	I/O	Pin No.	I/O Level
VTR DD ON	O	Pin ③ of IC501 on CO-2 board	VTR DC/DC converter on/off signal “H” when power of video or camera is turned on.
CAM DD ON	O	Pin ⑤ of IC501 on CO-2 board	Camera DC/DC converter on/off signal “H” when power of camera is turned on.
DATA SCREEN	O	Pin ⑥ of IC501 on CO-2 board	“H” when data screen is turned on.
SP/LP	O	Pin ⑦ of IC501 on CO-2 board	“H” during SP recording mode or playback of tape recorded in SP mode
SYS RESET	O	Pin ⑫ of IC501 on CO-2 board	Reset signal of AF microcomputer (IC802 on the CV-8 board) Normally: “H” (“L” pulse when power of video or camera is turned on.)
MIN 3	I	Pin ⑮ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
MIN 2	I	Pin ⑯ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
MIN 1	I	Pin ⑰ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
MIN 0	I	Pin ⑱ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
T/E LED	O	Pin ⑲ of IC501 on CO-2 board	Tape top/end LED lighting control signal STOP/PB/REC/PB-PAUSE/REC-PAUSE/REVIEW: 170 msec period “H” pulse, CUE: 22 msec period “H” pulse, FF/REW: 4 msec period “H” pulse, EJECT or CASSETTE IN detecting: 22 msec period “H” pulse
UNLD	O	Pin ⑳ of IC501 on CO-2 board	Normally: “L” (“H” in Unthreading, “H” pulse is output in Mechanical mode transition)
LD	O	Pin ㉑ of IC501 on CO-2 board	Normally: “L” (“H” in Threading, “H” pulse is output in Mechanical mode transition)
M OUT 4	O	Pin ㉒ of IC501 on CO-2 board	Key matrix output signal 20 msec period “H” pulse
M OUT 3	O	Pin ㉓ of IC501 on CO-2 board	Key matrix output signal 20 msec period “H” pulse
M OUT 2	O	Pin ㉔ of IC501 on CO-2 board	Key matrix output signal 20 msec period “L” pulse
M OUT 1	O	Pin ㉕ of IC501 on CO-2 board	Key matrix output signal 20 msec period “L” pulse
M OUT 0	O	Pin ㉖ of IC501 on CO-2 board	Key matrix output signal 20 msec period “L” pulse
TALLY	O	Pin ㉗ of IC501 on CO-2 board	TALLY LED control signal. Normally: “H” (“L” during REC mode when power switch is set to CAMERA position)

Signal	I/O	Pin No.	I/O Level
RESET	I	Pin ㉘ of IC501 on CO-2 board	Normally: “H” (Reset: “L”)
COSMO CS	I	Pin ㉙ of IC501 on CO-2 board	1V period “L” pulse (18 msec period in VTR mode)
COSMO SI	I	Pin ㉚ of IC501 on CO-2 board	1V period “H” pulse train (18 msec period in VTR mode)
COSMO SO	O	Pin ㉛ of IC501 on CO-2 board	1V period “L” pulse train (18 msec period in VTR mode)
COSMO SCK	I/O	Pin ㉜ of IC501 on CO-2 board	1V period “L” pulse train (18 msec period in VTR mode)
CAM P SW	I	Pin ㉝ of IC501 on CO-2 board	“L” when power switch (S501 on the VK-3 board) is set to CAMERA position and standby switch (S951 on the RC-29 board) to STANDBY position.
MIN 5	I	Pin ㉞ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
MIN 4	I	Pin ㉟ of IC501 on CO-2 board	No key matrix input signal: “H” (Other: “L”)
START/STOP	O	Pin ㊱ of IC501 on CO-2 board	Normally: “H” (“L” when start/stop button (S952 on the RC-29 board or S451 on the MA-37 board) is pressed.)
EJECT	I	Pin ㊲ of IC501 on CO-2 board	Normally: “H” (“L” when EJECT switch (S508 on VK-3 board) is pressed.)
LINCS	I	Pin ㊳ of IC501 on CO-2 board	Normally: “H” (“L” pulse when power button of the remote controller is turned on.)
DEW	I	Pin ㊴ of IC501 on CO-2 board	Normally: “H” (“L” when dew)
BATT DOWN	I	Pin ㊵ of IC501 on CO-2 board	Main battery voltage (CAM UNREG) is divided by RV551 (battery down adjustment) and input. For detecting battery end/pre-end.
STILL ADJ	I	Pin ㊶ of IC501 on CO-2 board	DC voltage set by RV552 (STILL adjustment) on the CV-8 board is input.
CLOG	I	Pin ㊷ of IC501 on CO-2 board	Normal playback: “L” (“H” when PB RF signal is not reproduced due to head clog, etc..)
PB SP/LP	I	Pin ㊸ of IC501 on CO-2 board	Recording speed mode detection signal in FF, REW, CUE or REVIEW mode (“H” in SP mode, “L” in LP mode)
VTR P SW	I	Pin ㊹ of IC501 on CO-2 board	“Normally: “H” (“L” when power switch (S501 on the VK-3 board) is set to video position.)

3-9-8. Mode/Mechanism Control — Mechanism Block Interface

Signal	I/O	Pin No.	I/O Level																				
S REEL FG	I	Pin ③ of CN001 on CC-26 board	Pulse (Approx. 4 Vp-p) that is generated by S-reel rotation. It is approx. 1 sec period in REC/PB (SP) mode.																				
MODE SW 2	I	Pin ④ of CN001 on CC-26 board	Pins are connected to mode switch for mechanical position detection. <table><tr><th></th><th>EJECTED</th><th>THREADING UNTHREADING</th><th>STOP</th><th>REC/PB/FF/ REW/CUE/ REVIEW/PAUSE</th></tr><tr><td>MODE SW 2 (④-⑦)</td><td>○</td><td>○</td><td>×</td><td>○</td></tr><tr><td>MODE SW 1 (⑤-⑦)</td><td>×</td><td>○</td><td>○</td><td>×</td></tr><tr><td>MODE SW 0 (⑥-⑦)</td><td>×</td><td>×</td><td>○</td><td>○</td></tr></table> ×.....Open ○.....Short		EJECTED	THREADING UNTHREADING	STOP	REC/PB/FF/ REW/CUE/ REVIEW/PAUSE	MODE SW 2 (④-⑦)	○	○	×	○	MODE SW 1 (⑤-⑦)	×	○	○	×	MODE SW 0 (⑥-⑦)	×	×	○	○
	EJECTED	THREADING UNTHREADING		STOP	REC/PB/FF/ REW/CUE/ REVIEW/PAUSE																		
MODE SW 2 (④-⑦)	○	○		×	○																		
MODE SW 1 (⑤-⑦)	×	○		○	×																		
MODE SW 0 (⑥-⑦)	×	×		○	○																		
MODE SW 1	I	Pin ⑤ of CN001 on CC-26 board																					
MODE SW 0	I	Pin ⑥ of CN001 on CC-26 board																					
M OUT 0 (COM)	O	Pin ⑦ of CN001 on CC-26 board																					
CC DOWN	I	Pin ⑧ of CN001 on CC-26 board	It is connected to cassette compartment down detection (CC DOWN) switch. When cassette compartment comes down, connection between Pins ⑧ and ⑦ are short-circuited. When cassette compartment comes up, connection between Pins ⑧ and ⑦ is open.																				
MOUT 0 (COM)	O	Pin ⑦ of CN001 on CC-26 board																					
END SENS	I	Pin ⑩ of CN001 on CC-26 board	Normally: "L" ("H" pulse is output in tape end or cassette unloaded)																				
13/10	I	Pin ⑪ of CN001 on CC-26 board	Not used																				
MP HG	I	Pin ⑫ of CN001 on CC-26 board	"H" pulse (20 msec period) is output when normal MP tape is used.																				
ME/MP	I	Pin ② of CN002 on CC-26 board	"L" in MP tape ("H" pulse (20 msec period) in cassette unloaded)																				
REC PROOF	I	Pin ④ of CN002 on CC-26 board	"L" when recording possible cassette is loaded. "H" pulse (20 msec period) is output, when recording inhibiting cassette is loaded.																				
TOP END LED	O	Pin ⑤ of CN002 on CC-26 board	"L" pulse (approx. 1 Vp-p) (pulse period is changed from 12 to 170 msec according to operation mode.)																				
TOP SENS	I	Pin ⑦ of CN002 on CC-26 board	Normally: "L" ("H" pulse is output in tape top or cassette unloaded)																				
T REEL FG	I	Pin ⑨ of CN002 on CC-26 board	Pulse (Approx. 4 Vp-p) that is generated by T-reel rotation, in REC/PB (SP) mode, it is approx. 1 sec period.																				

3-9-9. DDS Microcomputer (IC651 on CK-19 Board) — Peripheral Circuit Interface

PIN No.	Signal Name	I/O	Function and I/O Level
1	CMI 0	I	Key matrix input signal. Normally "H". When key input, "L" pulse for 18 ms (VTR mode) or 1V period (camera mode).
2	CMI 1	I	
3	CMI 2	I	
4	CMI 3	I	
5	CMO 0	O	Key matrix output signal. "L" pulse for 18 ms (VTR mode) or 1V period (camera mode).
6	CMO 1	O	
7	CMO 2	O	
8	CMO 3	O	
15	RESET	I	Normally "L".
16	CL 1	I	System clock oscillation pin. • Video power ON or camera power ON Continuous oscillation (oscillation frequency approx. 320 kHz) • Power OFF or backed up by lithium battery 500 ms intermittent oscillation (oscillation frequency approx. 70 kHz)
18	CL 2	O	
19	INT 1	I	Interrupt input by camera VD. VTR mode: "H" Camera mode: 1V period "H" pulse
21	DDS SCK	I/O	Serial communication-serial clock I/O. V period "L" pulse train.
22	DDS SO	O	Serial communication-data output. V period "H" pulse train.
24	DDS SI	I	Serial communication-data input. V period "L" pulse train.
25	CG BUSY	I	Busy signal input from character generator. V period "H" pulse train.
26	VTR PWR	I	SS 5V power detection. "H" while power ON.
27	LI PE	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
28	TEST	I	Test mode input. Normally "H".
29	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
30	COSMO CS	O	Chip select signal to servo/system control microcomputer (IC501 on CO-2 board). 1V period "L" pulse.
31	EVR CS	O	Chip select signal to EVR microcomputer (IC601 on CV-8 board). 1V period "L" pulse.
32	CMO 4	O	Key matrix output signal. "H" pulse for 18 ms (VTR mode) or 1V period (camera mode).
34	TITLE CS	O	Chip select signal to title controller Not used.
35	SRAM CS	O	Chip select signal to static RAM Not used.
36	TG STB	O	Strobe signal to timing generator (CV-8 board, DT-73 board). Camera mode: 1V period "H" pulse. VTR mode: "L"
38	X1		Crystal oscillation circuit for clock. Oscillation frequency of 32.768 kHz.
39	X2		

3-9-10. EVR Microcomputer (IC601 on CV-8 Board) — Peripheral Circuit Interface

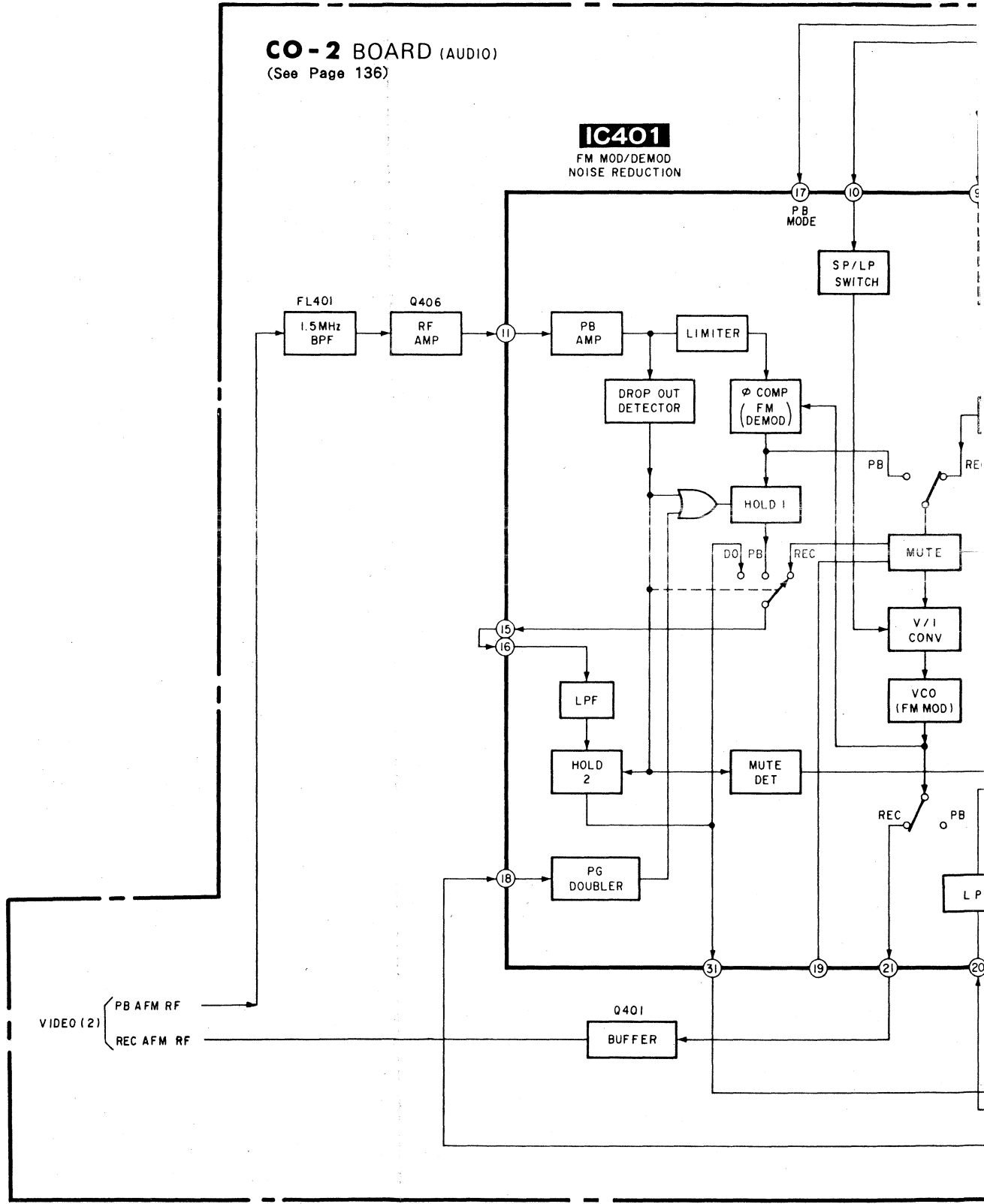
PIN No.	Signal Name	I/O	Function and I/O Level
1	—	—	—
2	DA SSW	O	“H” only during communication with serial switching D/A converter. V period “H” pulse.
3	$\overline{\text{EVR SCLK}}$	O	Serial clock output. V period “L” pulse train.
4	EVR SI	I	Serial data input. V period “H” pulse train.
5	EVR SO	O	Serial data output. V period “L” pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. V period “L” pulse.
7	L IN	I	LINCS input. L: 0, H: 1. V period “H” pulse train.
8	L OUT	O	LINCS output. L: 0, H: 1. V period “H” pulse train.
9	$\overline{\text{CAM ADJ}}$	I	Normal/Adjust selection. Normally “H”. “L” during adjustment.
10	NC	—	NC
11	DDS SSW	O	DDS serial selection. V period “L” pulse.
12, 13	LD	O	Data load instruction to EVR (IC608, IC609). V period “H” pulse.
14	BL	—	“L” for back light compensation ON.
15	IN/OUT	I	Indoors/outdoors mode discrimination input. “H”: indoors, “L”: outdoors.
16	—	—	—
17	Vpp	—	EEPROM write voltage supply: connected to GND.
18	—	—	GND
19	—	—	—
20	PAL/NTSC	I	Broadcast system selection. L: NTSC, H: PAL.
21	GND	—	—
22	GND	—	—
23	GND	—	—
24, 25	GND	—	—
26	GND	—	—
27	GND	—	—
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally 2V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally “L”. “H” during auto white balance adjustment.
31	—	—	NC
32	DPCS	—	—
33	—	—	—
34	S3SW	O	AWB measurement signal selection. 3V period “H” pulse.
35	S2SW	O	AWB measurement signal selection. 3V period “H” pulse.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. V period “H” pulse.
37	—	—	—
38	S1SW	O	AWB measurement signal selection. 3V period “H” pulse.
39	—	—	—
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	VDD	—	Connected to EVER 5V.
43	—	—	—
44	$\overline{\text{RESET}}$	—	Normally “H”. “L” when reset.
45	$\overline{\text{IRQ}}$	—	Connected to $\overline{\text{EVR CS}}$ signal. V period “L” pulse.
46	—	—	EVER 5V
47	—	—	EVER 5V
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Not used.

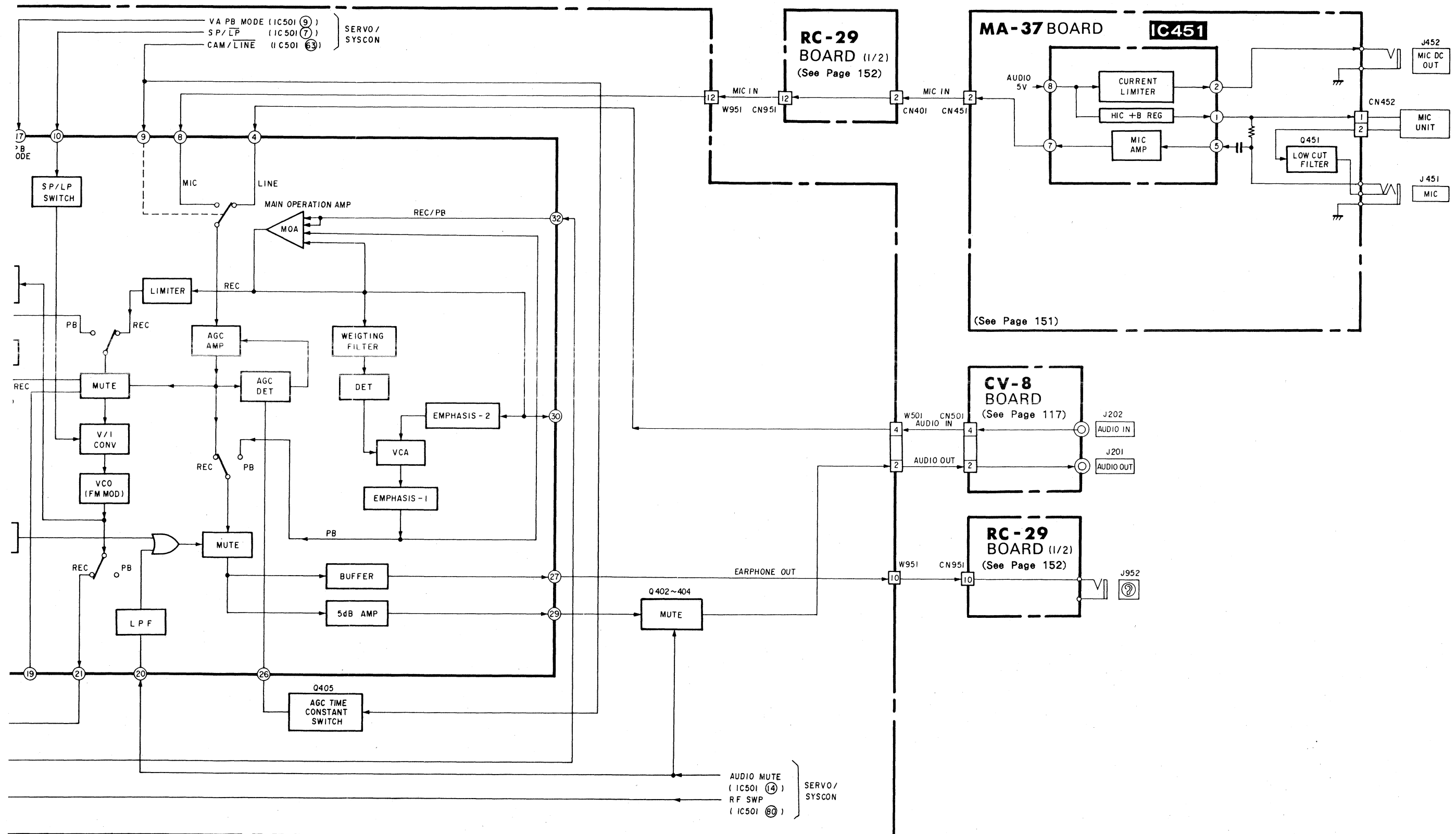
3-9-11. AF Microcomputer (IC802 on CV-8 Board) — Peripheral Circuit Interface

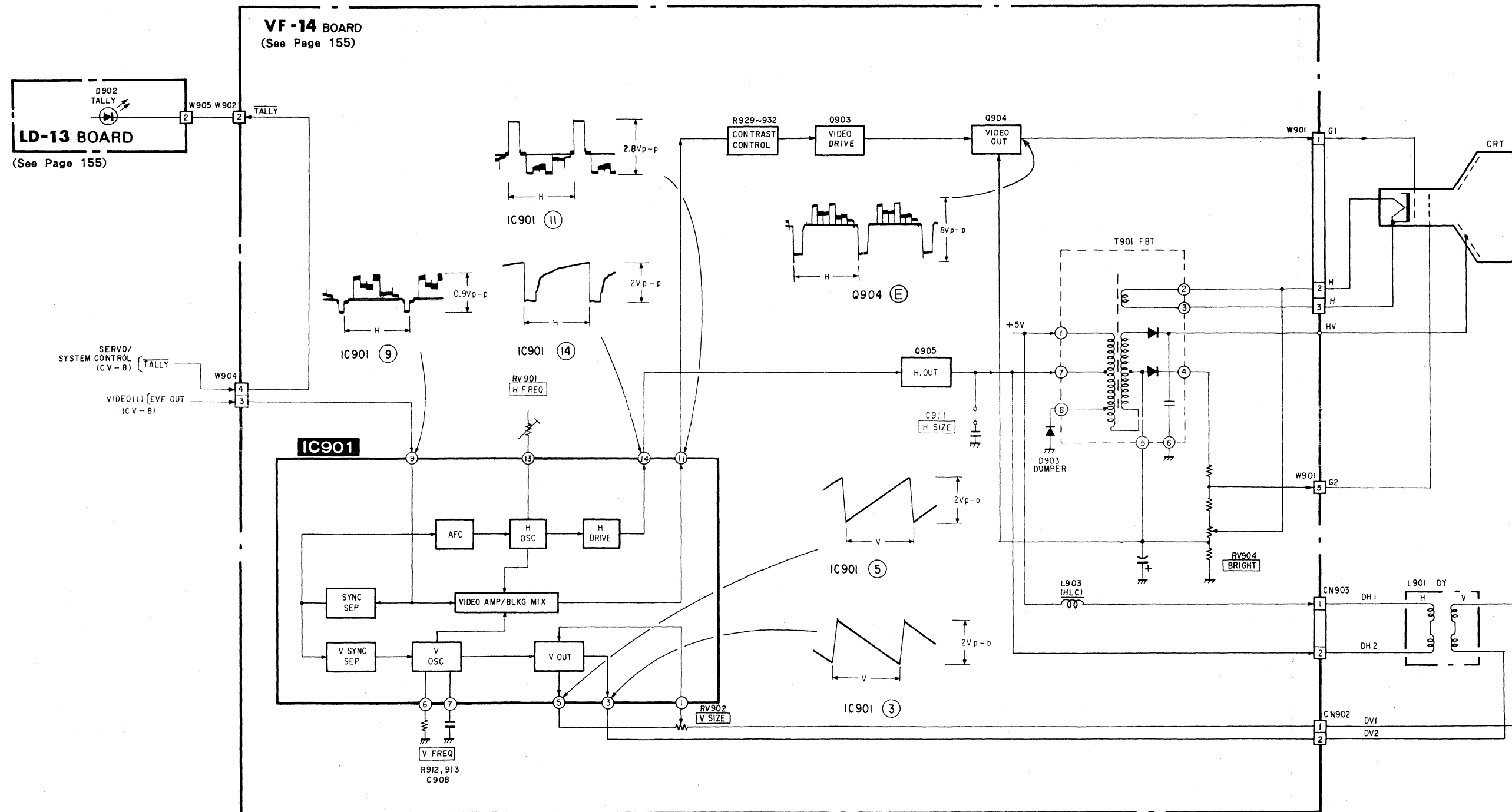
PIN No.	Signal Name	I/O	Function and I/O Level
1	$\overline{\text{SS OUT}}$	O	EVR data read timing output (PD5 SS input). V period “L” pulse train.
2	IRIS IN/ $\overline{\text{OUT}}$	O	Indoors/outdoors determination according to aperture value. “H” for indoors and “L” for outdoors.
3	—	—	—
4	—	—	—
5	—	—	—
6	$\overline{\text{LOW CONTRAST}}$	O	Signal to DDS microcomputer (IC651 on CK-19 board). “L” when subject has low contrast.
7	—	—	—
8	—	—	Not used.
9	—	—	—
10	—	—	—
11	$\overline{\text{ZOOM T}}$	O	Normally “H”. “L” when zoom motor is rotated in telephoto direction by remote control.
12	$\overline{\text{ZOOM W}}$	O	Normally “H”. “L” when zoom motor is rotated in wide angle direction by remote control.
13	Focus N	O	Normally “L”. “H” when focus motor is rotated in close range direction.
14	—	—	—
15	Focus ∞	O	Normally “L”. “H” when focus motor is rotated in far range direction.
16	F SPD ϕ	O	Bit 0 (LSB) of focus motor speed control signal.
17	—	—	—
18	F SPD1	O	Bit 1 of focus motor speed control signal.
19	F SPD2	O	Bit 2 of focus motor speed control signal.
20	—	—	—
21	F SPD3	O	Bit 3 (MSB) of focus motor speed control signal.
22	—	—	—
23	Vss	—	Connected to GND.
24	Vss	—	Connected to GND.
25	—	—	—
26	$\overline{\text{Focus N}}$	I	“L” when focus ring is at close range edge.
27	—	—	—
28	—	—	—
29	—	—	—
30	$\overline{\text{FOCUS } \infty}$	O	“L” when focus ring is at far range edge.
31	AF SSW	O	Timing output for bus selection. V period “H” pulse.
32	—	—	—
33	DA STB	O	For AF D/A converter data latch. V period “H” pulse train.
34	PAL/NTSC	I	NTSC/PAL selection.
35	—	—	—
36	J STB	O	For external display jig data latch. V period “L” pulse.
37	XCS	O	Active “L” for communication request to IC801 CXD-1204. V period “L” pulse.
38	TEST	—	Connected to VDD.
39	—	—	—
40	MODE	—	Connected to VDD.
41	MISO	I/O	SPI Master: in, Slave: out. V period “H” pulse train.
42	MOSI	I/O	SPI Master: out, Slave: in. V period “L” pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI serial clock. V period “L” pulse train.
44	—	—	—
45	$\overline{\text{SS}}$	I	V period “L” pulse train.
46	—	—	—

PIN No.	Signal Name	I/O	Function and I/O Level
48	EVR CS	I	"L" for EVR data communication request from DDS microcomputer. V period "L" pulse.
49	—	—	
50	—	—	
51	Focus FG	I	Interrupt generation at falling edge of focus motor FG. "H" when auto focus OFF. When auto focus ON, "L" pulse with period according to rotational speed of focus motor.
52	CLK OUT	O	Waveform shaped output of Pin ⑤ clock. (1.79 MHz)
53	—	—	
54	CLK IN	I	External clock input. 14.3 MHz clock input to Pin ② of IC801 is divided to 1/8 and input.
55	VDD		CAM 4.75V
56	—	—	
57	—	—	
58	—	—	
59	—	—	
60	SYS RST	I	Normally "H". "L" when reset.
61	AREA	I	Interrupt generation at falling edge from CXD-1204 (IC801). V period pulse.
62	Vpp		CAM 4.75V
63	WND W/N	I	Auto focus range area selection. Connected to VDD by 100 kΩ (fixed at wide range side).
64	—	—	

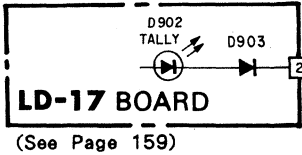
3-10. AUDIO BLOCK DIAGRAM



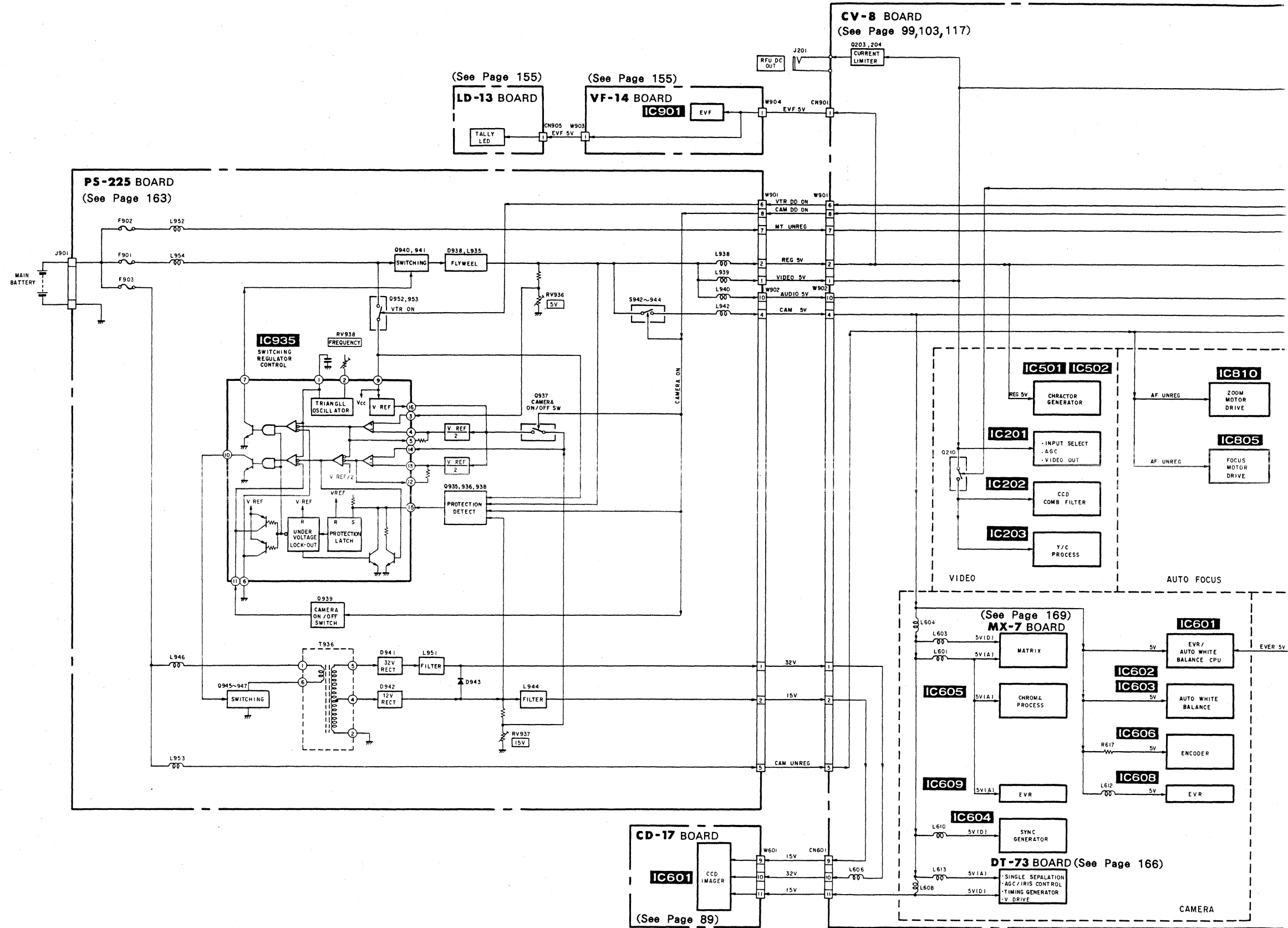




3-12. VIEW FINDER BLOCK DIAGRAM (TYPE B)



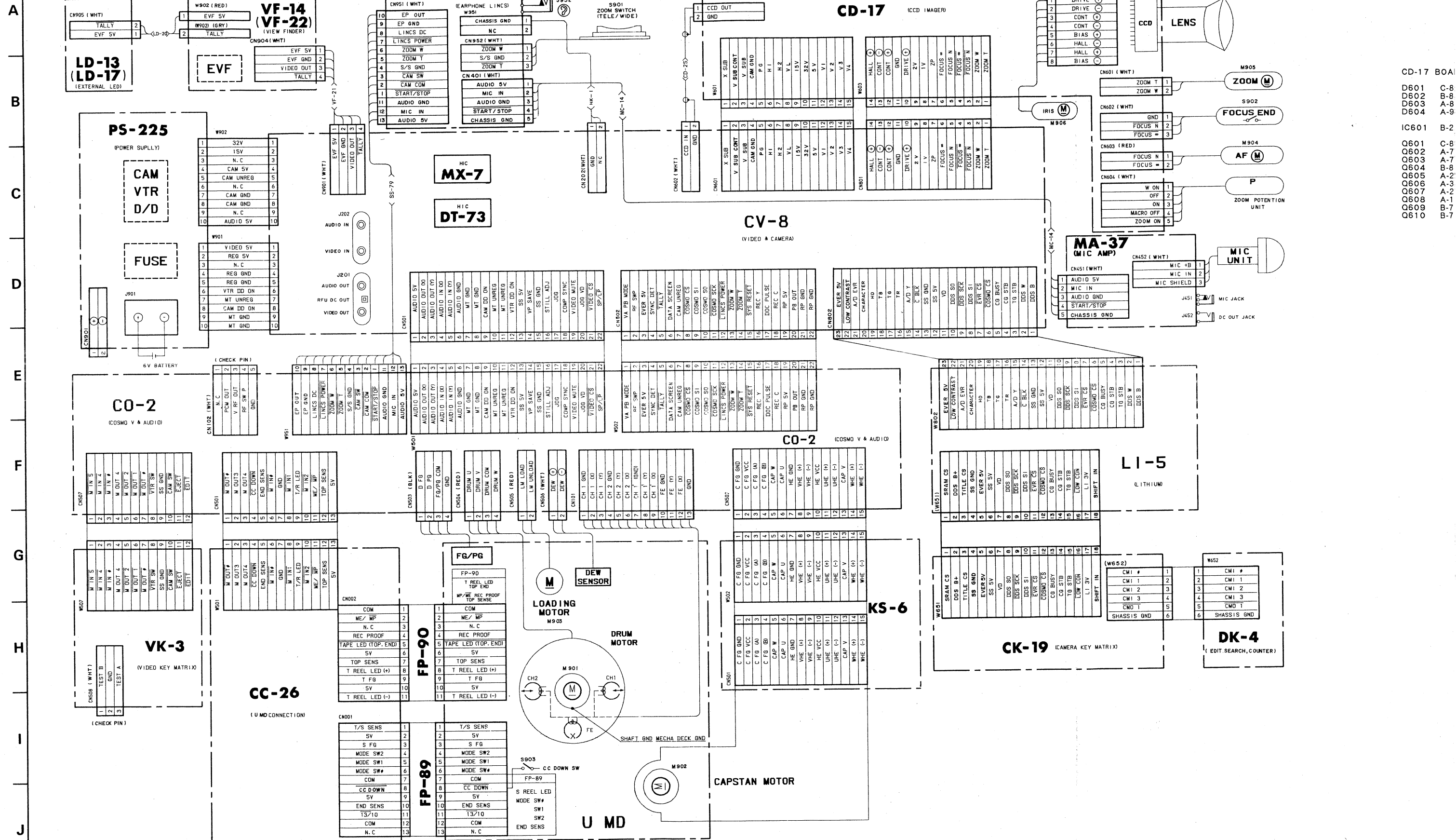
3-13. POWER BLOCK DIAGRAM



SECTION 4

PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



CD-17 BOA
D601 C-8
D602 B-8
D603 A-8
D604 A-9
IC601 B-2
Q601 C-8
Q602 A-7
Q603 A-7
Q604 B-8
Q605 A-2
Q606 A-3
Q607 A-1
Q608 B-7
Q609 B-7
Q610 B-7

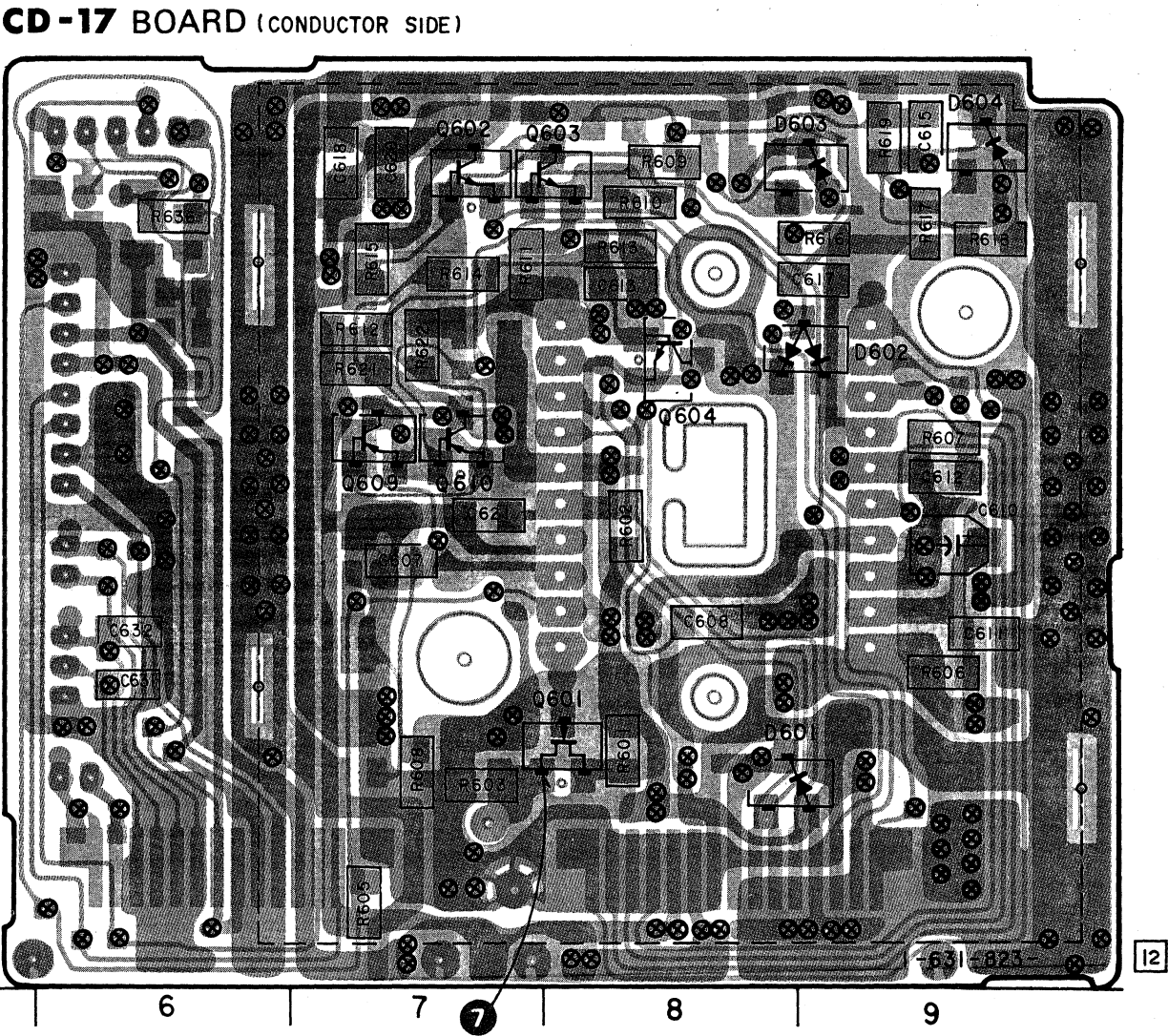
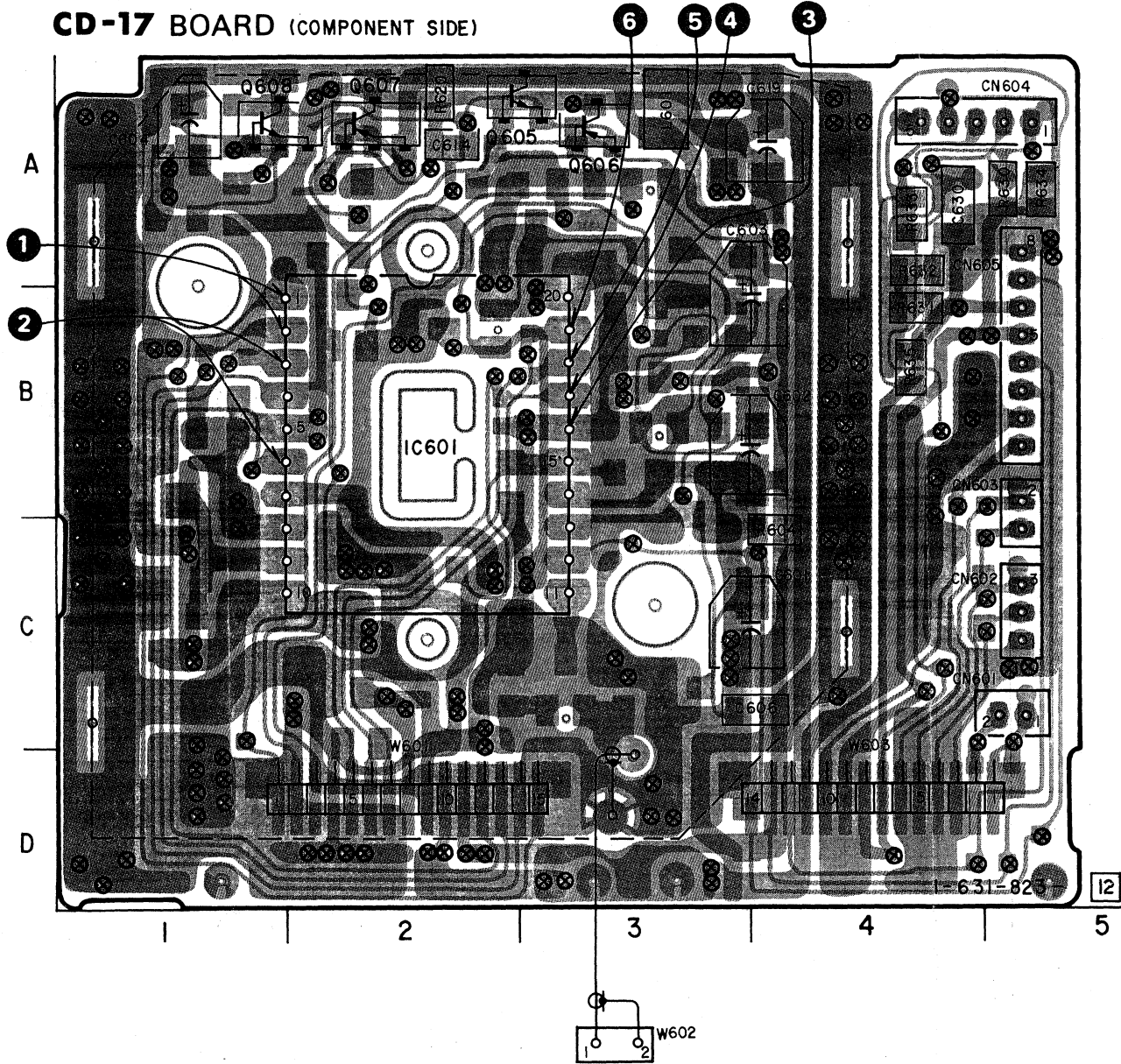
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

CD-17 (CCD IMAGER/ZOOM, FOCUS) PRINTED WIRING BOARDS

— Ref. No. CD-17 BOARD: 1000 series —

CD-17 BOARD

D601	C-8
D602	B-8
D603	A-8
D604	A-9
IC601	B-2
Q601	C-8
Q602	A-7
Q603	A-7
Q604	B-8
Q605	A-2
Q606	A-3
Q607	A-2
Q608	A-1
Q609	B-7
Q610	B-7

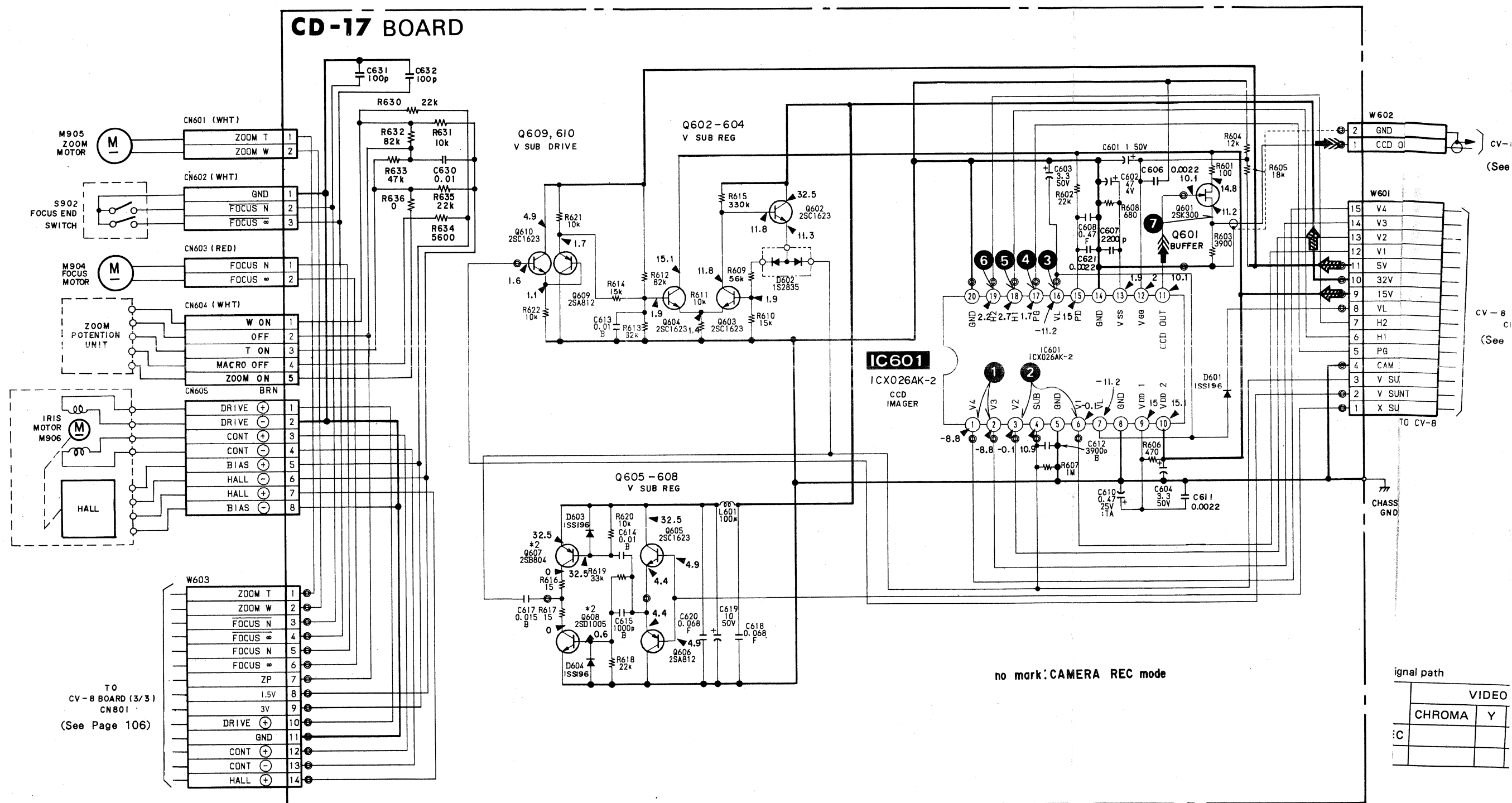


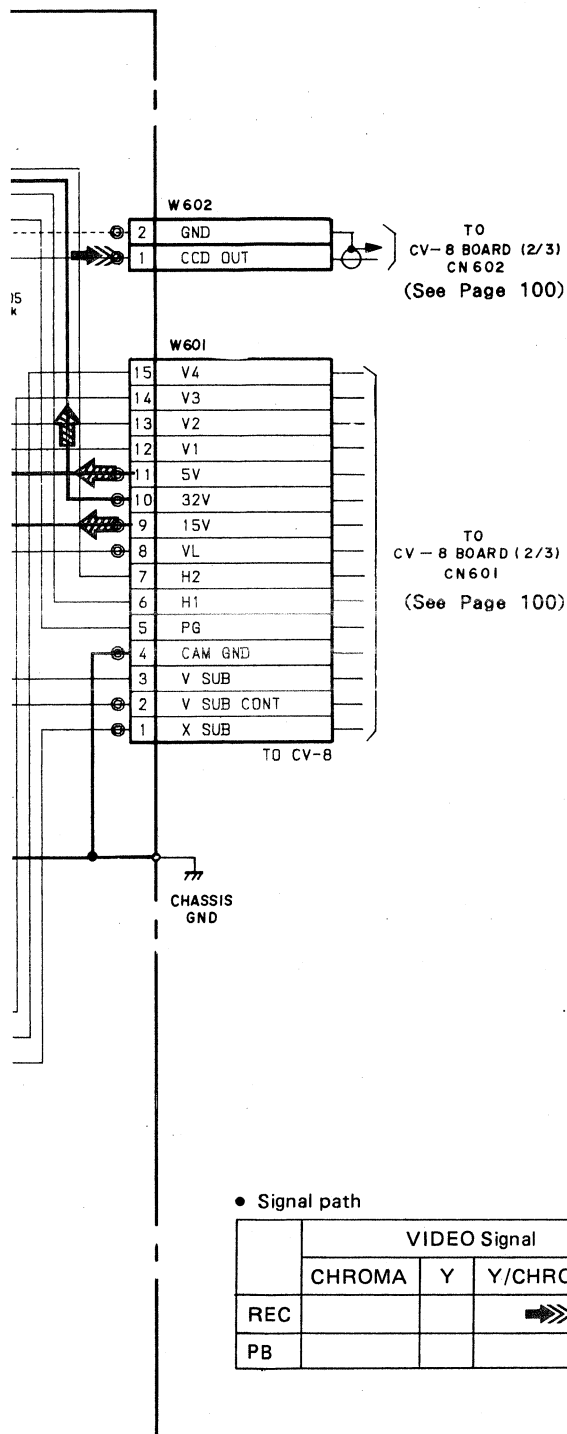
CAUTIONS FOR REPLACEMENT OF CCD IMAGER

- When you replaced the CCD imager adjust the whole camera assembly.
 - CCD imager has such a structure that it may be destructed by static electricity, so handle it with a care similar for MOS IC.
- Further, be certain that the light receiving part has no stick of dust and no entry of bright light.

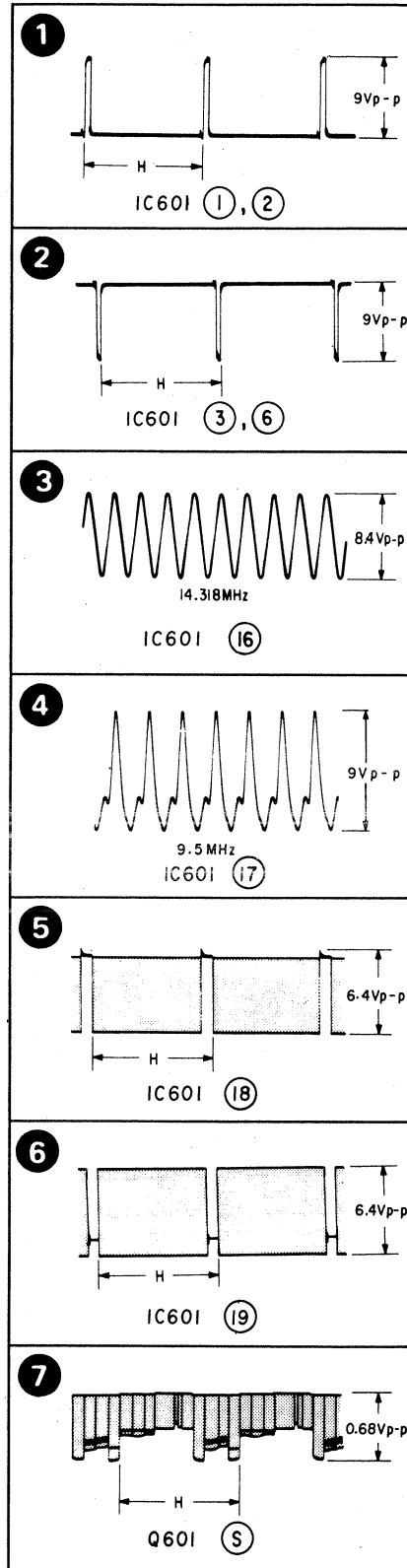
CD-17 (CCD IMAGER/ZOOM, FOCUS) SCHEMATIC DIAGRAMS

— Ref. No. CD-17 BOARD: 1000 series —





CD-17 BOARD



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

• For printed wiring boards.

- : indicated a lead wire mounted on the component side.
- : indicated a lead wire mounted on the conductor side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : Circled numbers refer to waveforms.

Caution:

Pattern face side: Parts on the pattern face side seen from (Conductor Side) the pattern face are indicated.
Parts face side: Parts on the parts face side seen from the (Component side) parts face are indicated.

• For schematic diagrams.

- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
Chip resistor are 1/10W unless otherwise noted.
kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μμF.
50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : adjustment for repair.
- : B+ Line.
- ➡ : IN/OUT direction of (+, -) B LINE.
- Circled numbers refer to waveforms.

Note:

The components identified by mark ▲ or dotted line with mark ▲ are critical for safety. Replace only with part number specified.

Note:

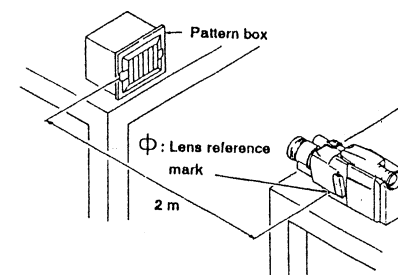
Les composants identifiés par une marque ▲ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

• Measuring conditions voltage value and waveform. (CAMERA, CAMERA FUNCTION block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points. Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

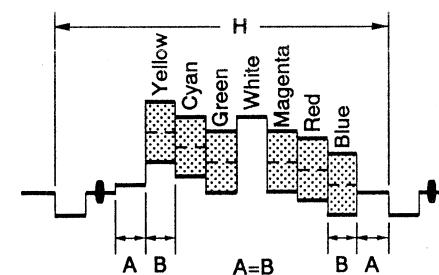


Fig. a (Video output terminal output waveform)

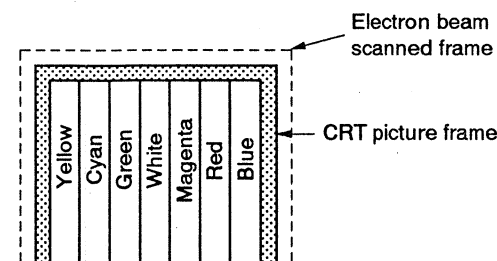
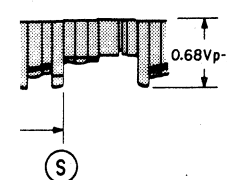
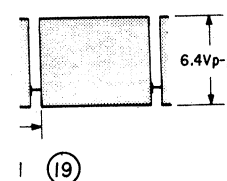
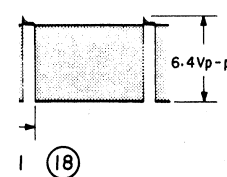
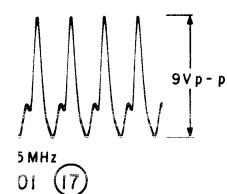
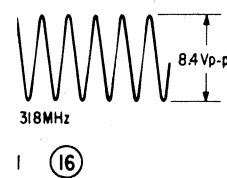
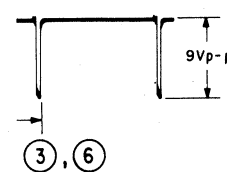
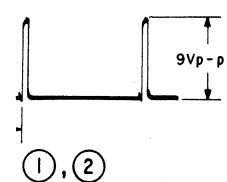


Fig. (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, VIDEO FUNCTION, VIEW FINDER block)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

• **For printed wiring boards.**

- — : indicated a lead wire mounted on the component side.
- — : indicated a lead wire mounted on the conductor side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- : Pattern of the rear side.
- : Circled numbers refer to waveforms.

Caution:

Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.

Parts face side: Parts on the parts face side seen from the parts face are indicated.

• **For schematic diagrams.**

- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
Chip resistor are 1/10W unless otherwise noted.
kΩ : 1000Ω, MΩ : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF: μF.
- 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : adjustment for repair.
- : B+ Line.
- : IN/OUT direction of (+, -) B LINE.
- Circled numbers refer to waveforms.

Note:

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

Note:

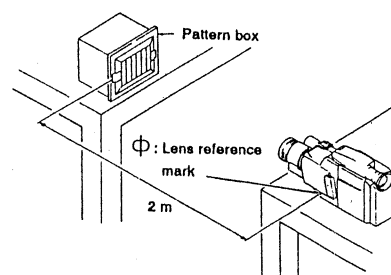
Les composants identifiés par une marque sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

• **Measuring conditions voltage value and waveform.**
(CAMERA, CAMERA FUNCTION block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points. Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

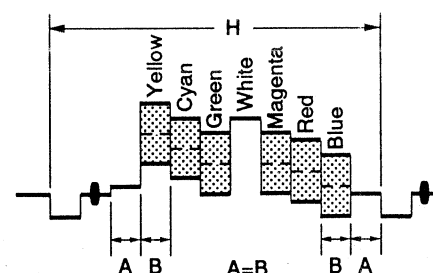


Fig. a (Video output terminal output waveform)

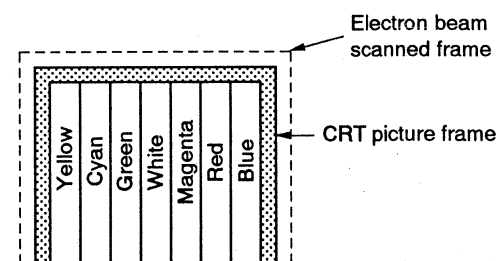


Fig. (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, VIDEO FUNCTION, VIEW FINDER block)

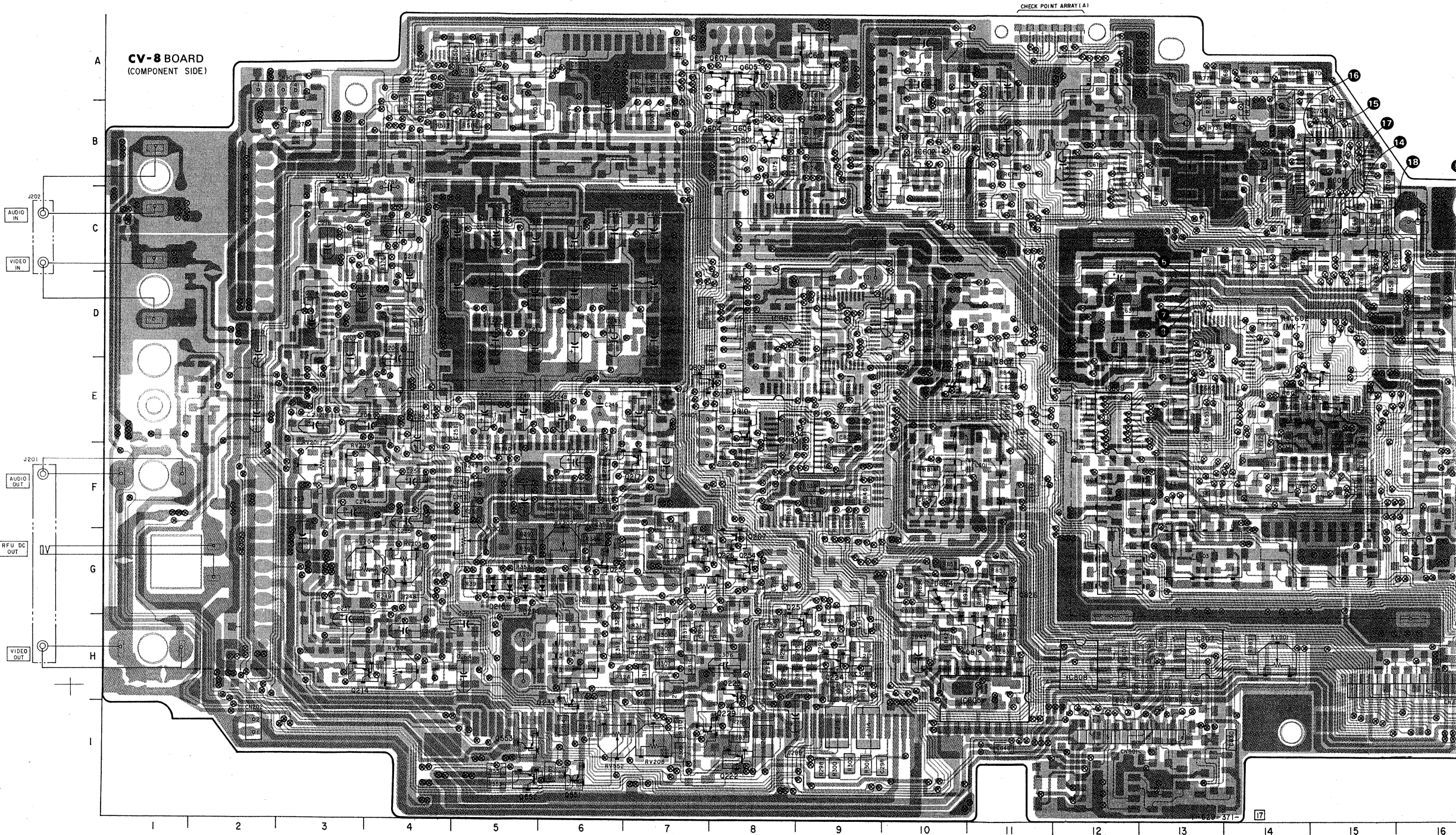
- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

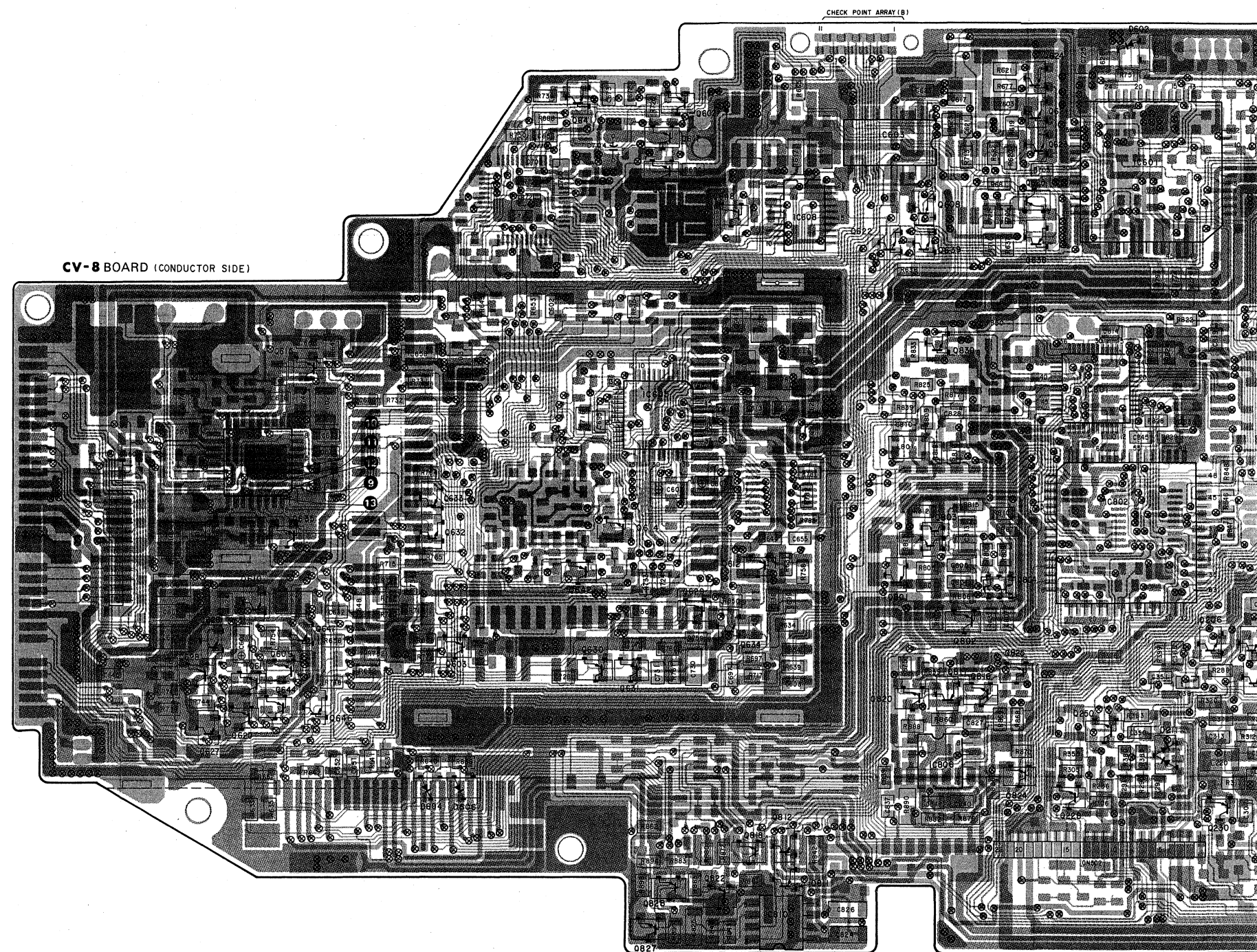
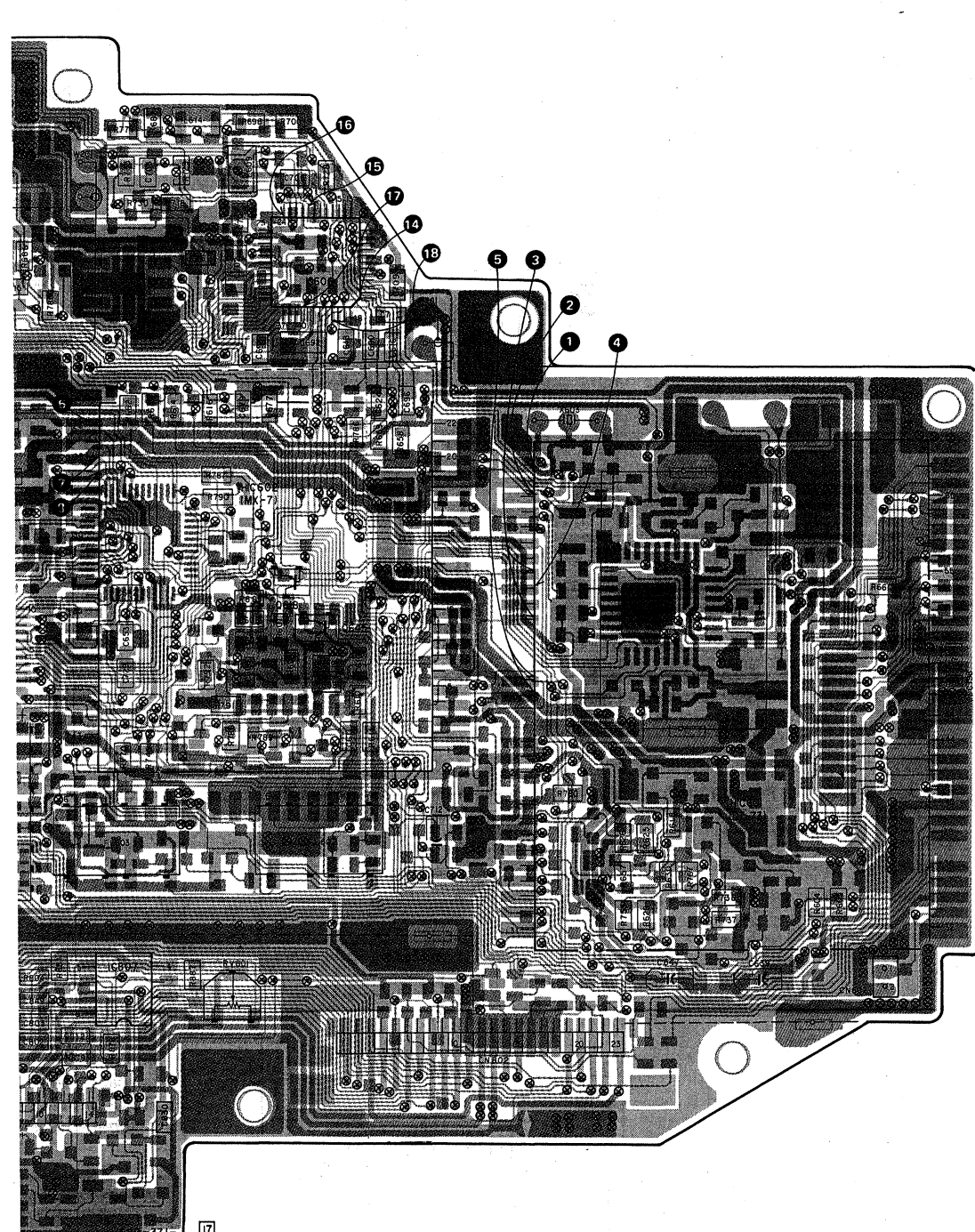
CV-8 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

— Ref. No. CV-8 BOARD: 2000 series —

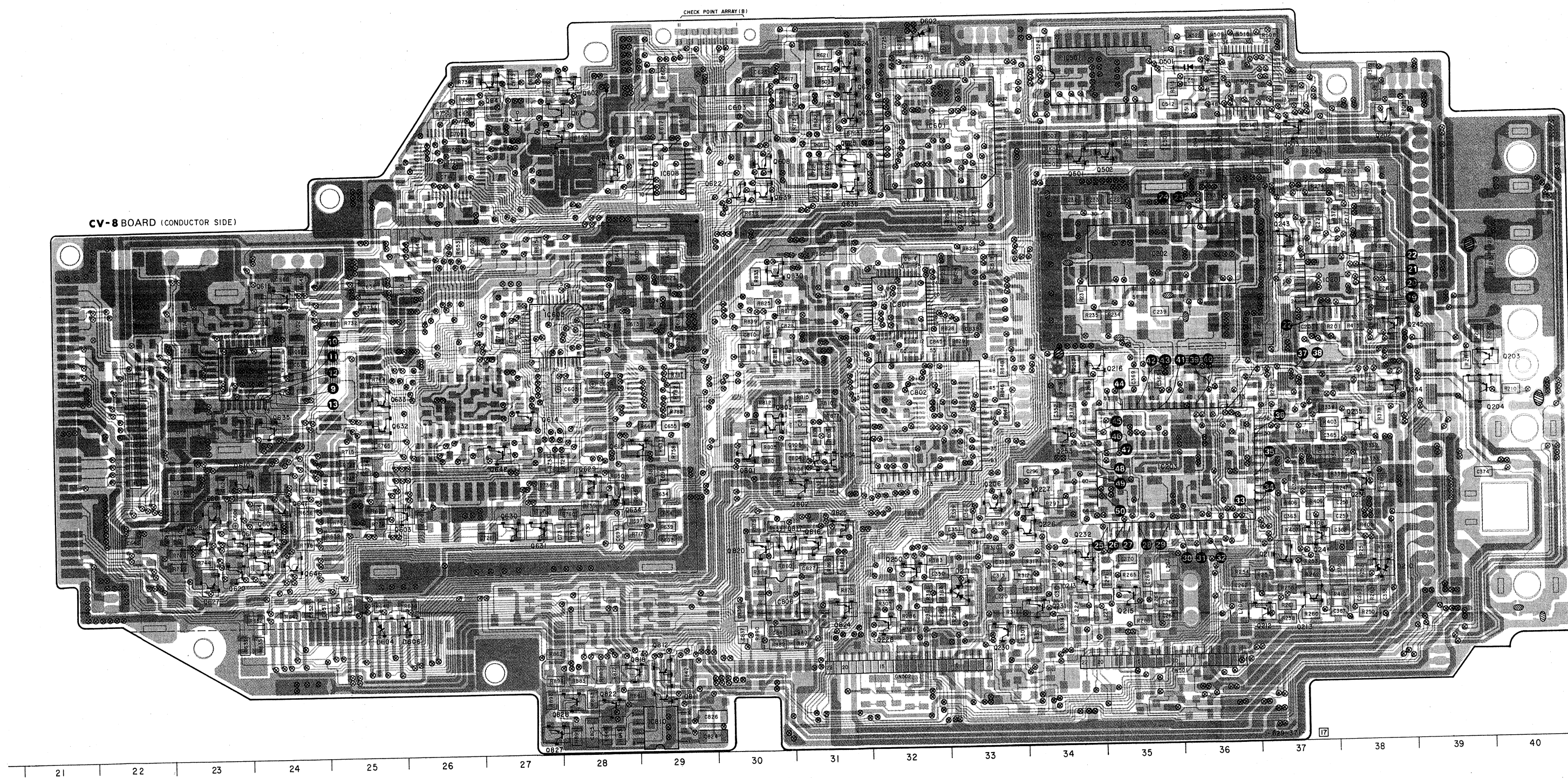
CV-8 BOARD

D210	H-38	Q607	A-8
D211	H-33	Q608	B-30
D213	H-34	Q609	G-24
D214	G-5	Q610	F-23
D501	A-36	Q611	G-23
D801	B-8	Q612	F-28
D802	A-32	Q614	F-27
D804	H-25	Q615	D-24
D806	H-26	Q617	B-28
D804	G-10	Q618	E-15
		Q619	B-28
		Q620	H-23
IC201	D-38	Q621	A-31
IC202	D-35	Q622	C-30
IC203	F-35	Q623	B-31
IC501	A-34	Q624	A-31
IC502	A-36	Q625	B-31
IC601	B-32	Q626	G-23
IC602	B-10	Q627	H-23
IC603	B-30	Q628	G-23
IC604	E-23	Q629	F-28
IC605	D-27	Q630	G-27
IC606	B-15	Q631	G-27
IC608	B-29	Q632	F-25
IC609	E-12	Q633	E-25
IC610	A-9	Q634	G-28
IC801	D-32	Q635	F-24
IC802	E-32	Q638	C-31
IC803	D-8	Q639	C-30
IC804	E-8	Q641	A-27
IC805	H-11	Q642	F-27
IC806	H-30	Q644	G-24
IC807	H-13	Q645	E-15
IC808	H-12	Q646	G-24
IC810	I-29	Q647	G-24
		Q648	B-28
Q202	B-38	Q801	F-30
Q203	E-40	Q802	G-31
Q204	E-39	Q803	F-30
Q206	G-33	Q804	F-31
Q207	C-2	Q806	E-10
Q210	C-3	Q807	E-11
Q211	G-37	Q809	E-7
Q212	H-37	Q810	F-8
Q213	H-37	Q811	I-29
Q214	H-3	Q812	I-29
Q215	H-35	Q816	G-31
Q216	E-35	Q817	G-31
Q217	F-7	Q818	I-28
Q222	I-8	Q819	H-12
Q223	H-8	Q820	G-30
Q224	H-9	Q822	I-28
Q225	G-8	Q824	H-31
Q226	G-34	Q825	G-31
Q227	G-34	Q826	G-11
Q228	H-32	Q827	I-27
Q229	I-8	Q828	I-28
Q230	H-33	Q830	D-30
Q231	H-34		
Q232	G-34		
Q233	I-6		
Q235	F-38		
Q236	G-38		
Q241	G-37		
Q243	C-37		
Q244	E-38		
Q245	E-38		
Q250	H-32		
Q251	H-9		
Q252	G-6		
Q253	F-34		
Q254	G-8		
Q501	B-34		
Q502	B-35		
Q503	B-37		
Q551	I-6		
Q552	I-5		
Q553	I-5		
Q602	A-28		
Q603	G-25		
Q604	B-8		
Q605	A-8		
Q606	B-8		





13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33



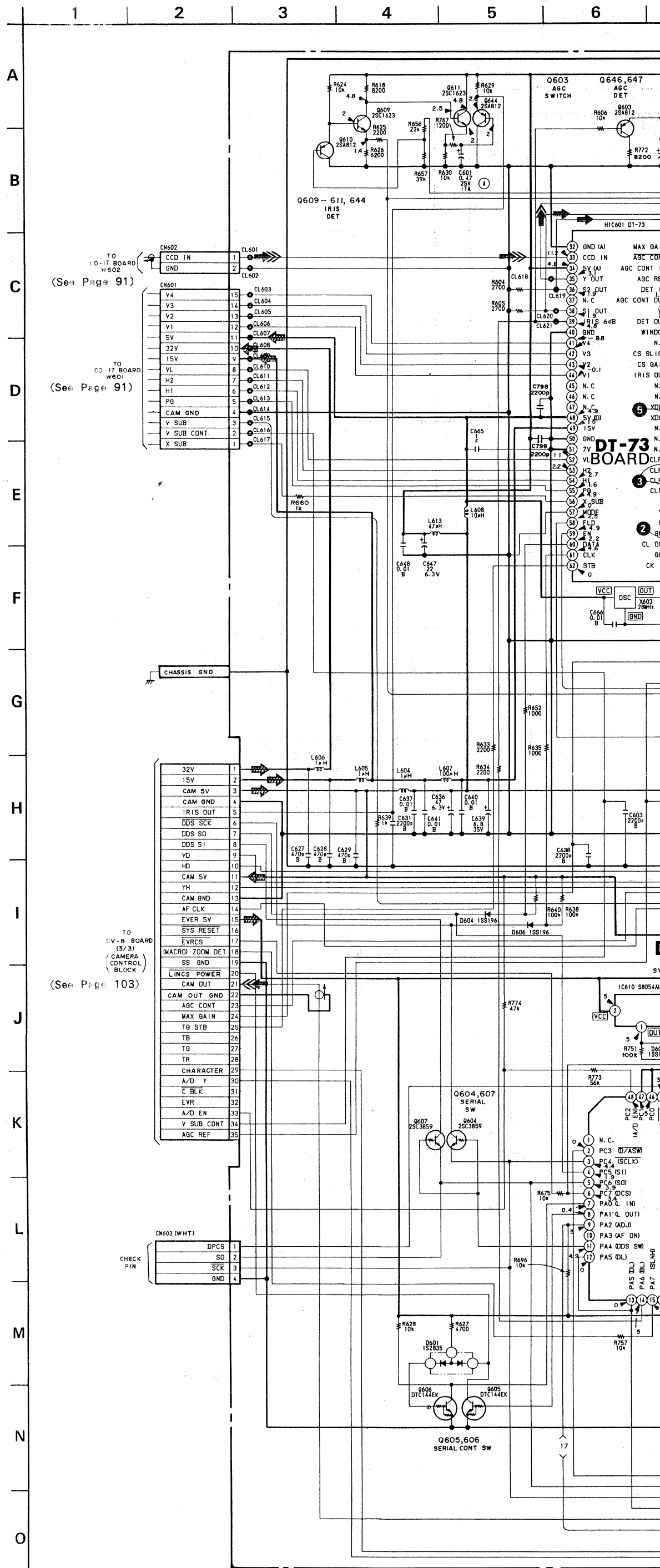
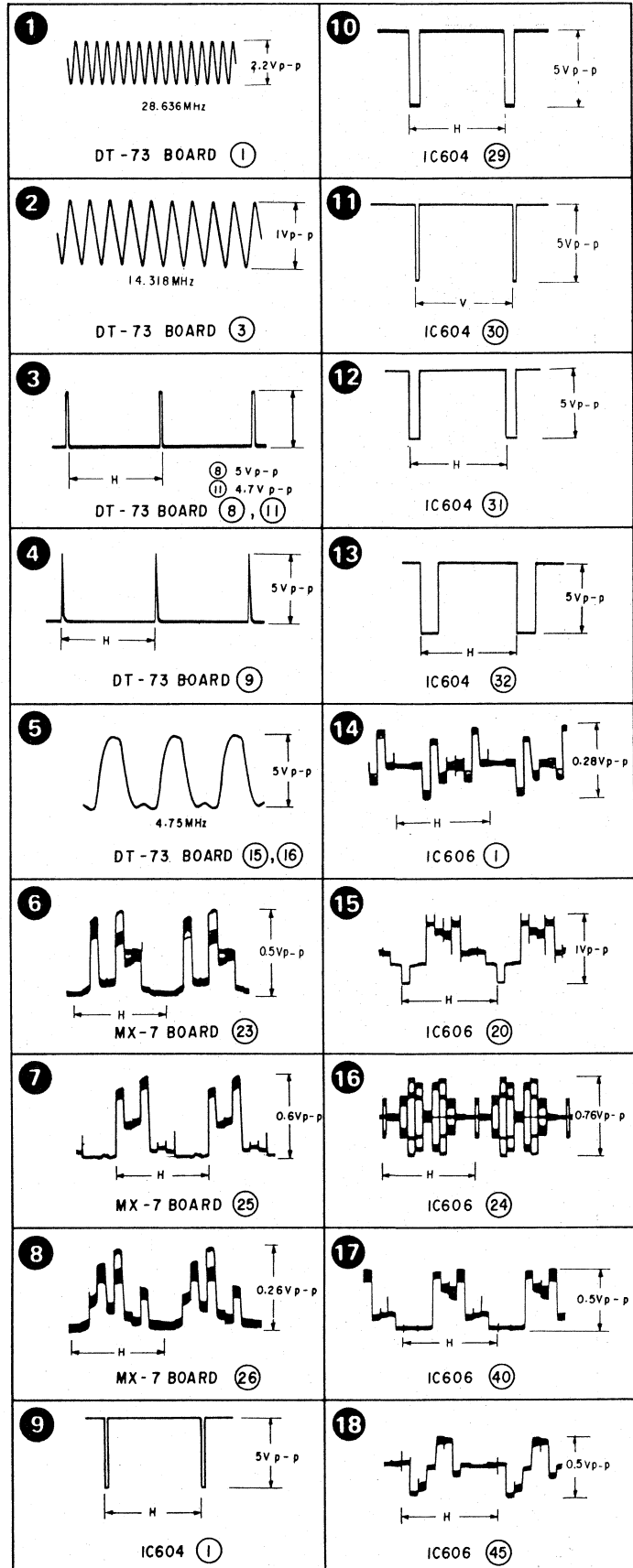
CV-8 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. CV-8 BOARD: 2000 series —

• Signal path

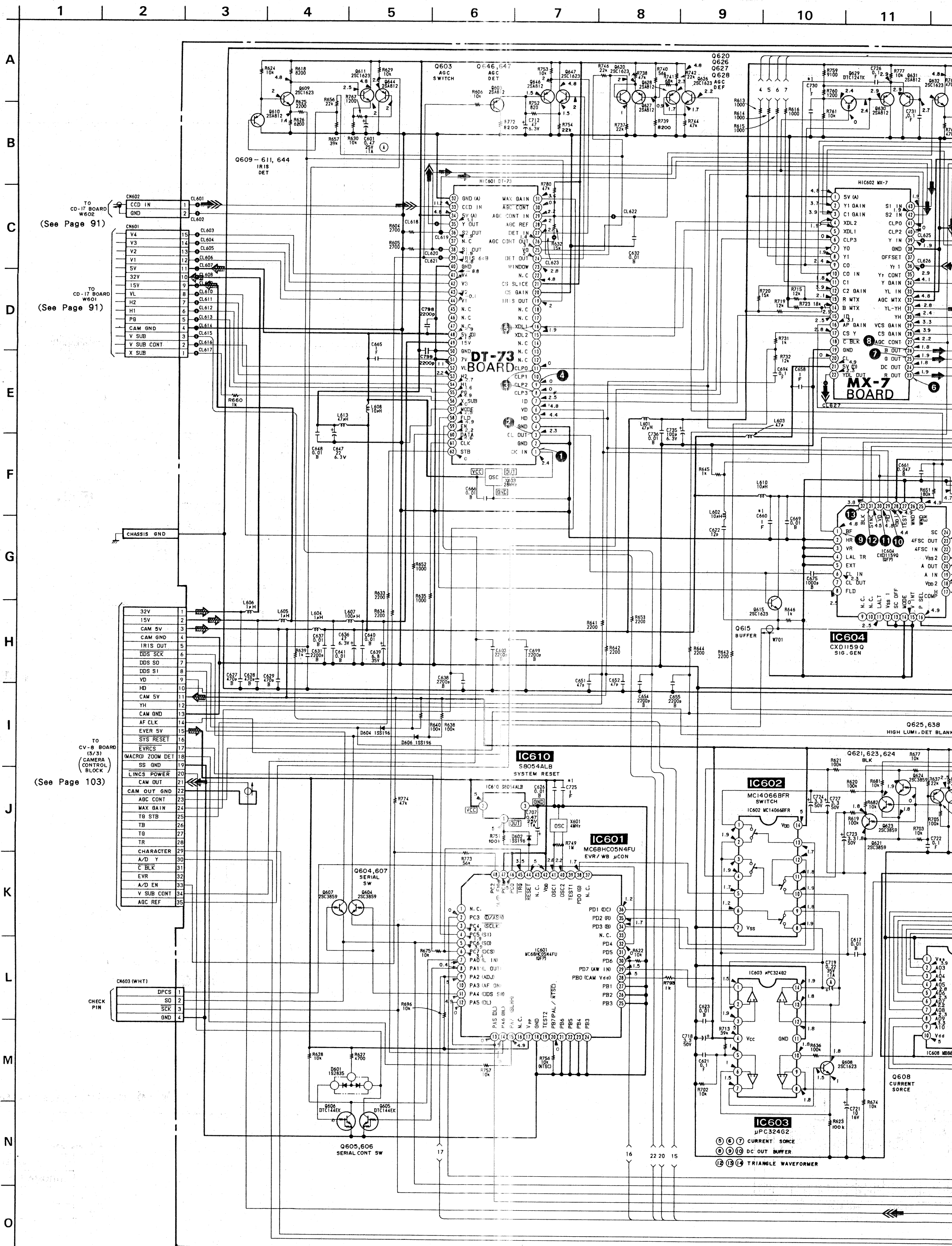
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	
PB				

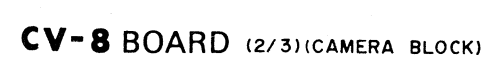
CV-8 BOARD (CAMERA)



CV-8 (CAMERA) SCHEMATIC DIAGRAMS

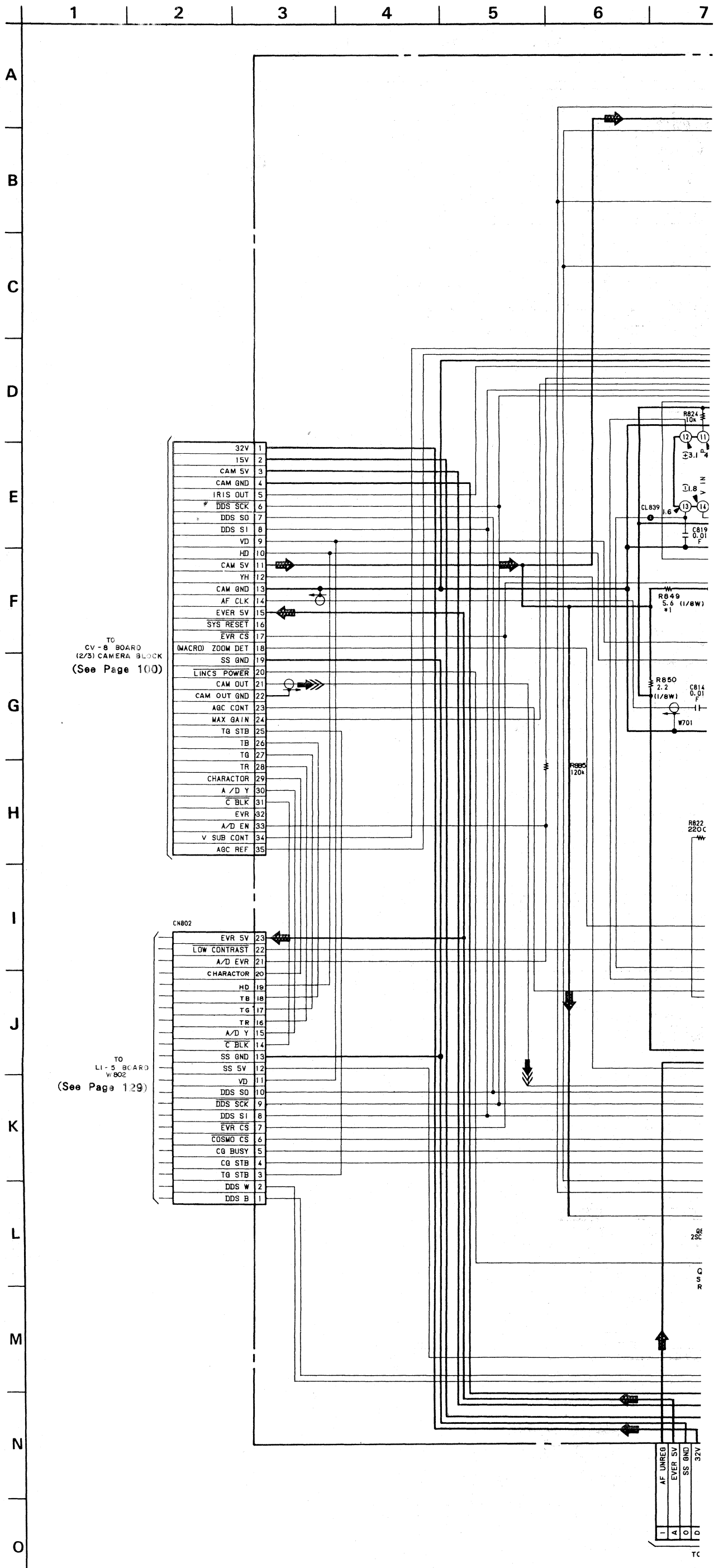
— Ref. No. CV-8 BOARD: 2000 series —

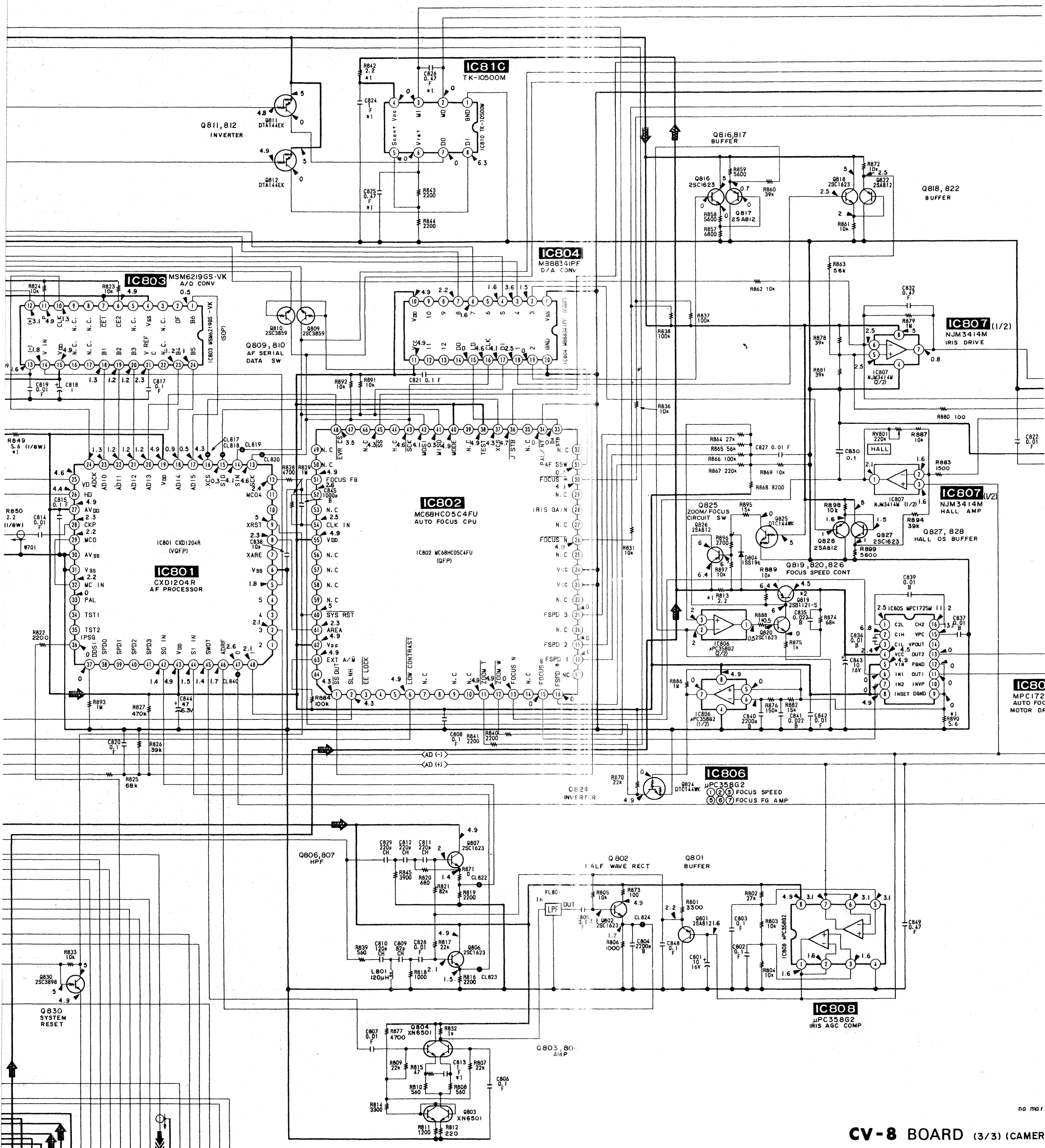




CV-8 (CAMERA) SCHEMATIC DIAGRAMS

— Ref. No. CV-8 BOARD: 2000 series —



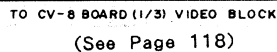


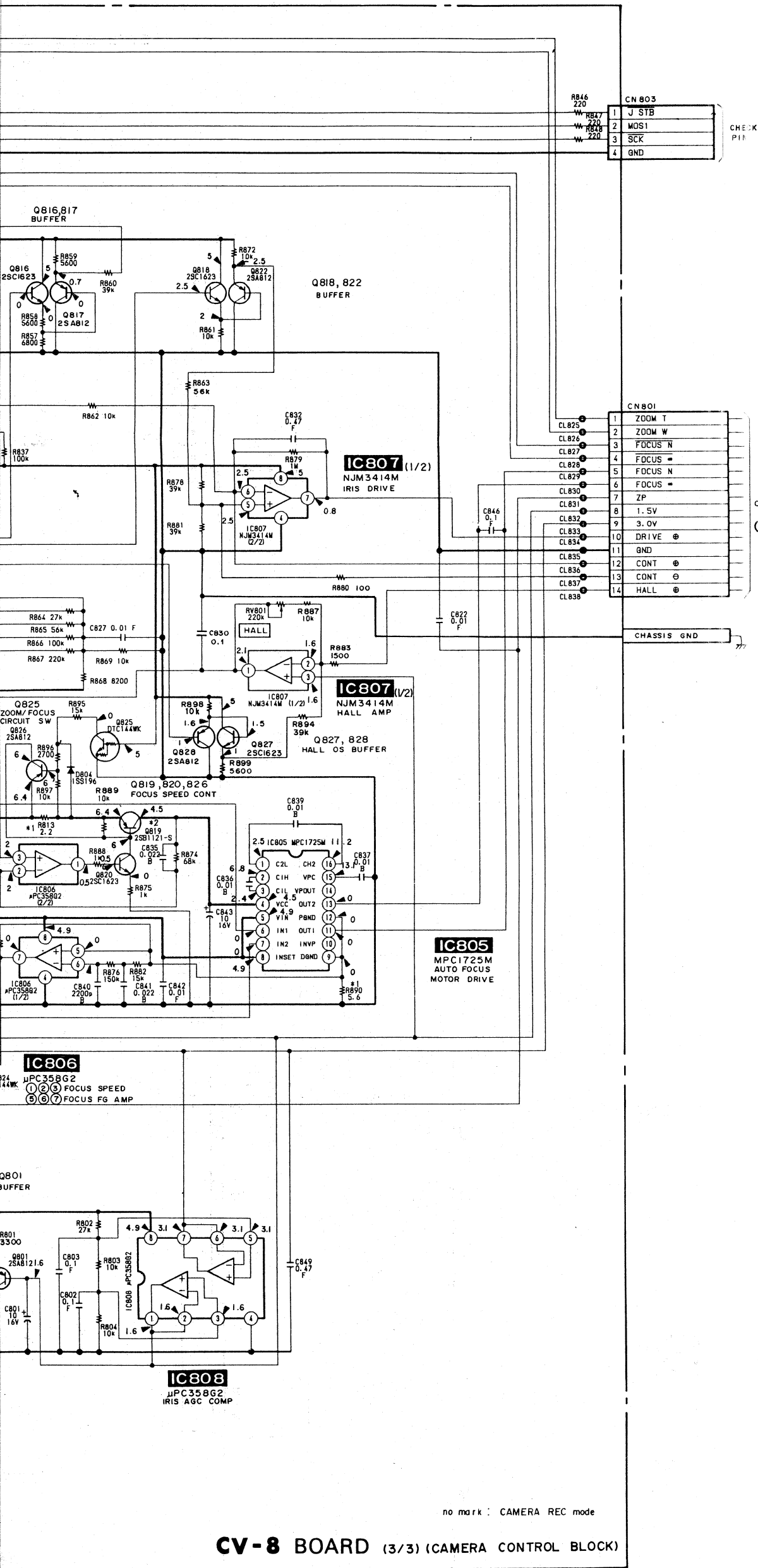
CV-8 BOARD (3/3) CAMER.

• Signal path

	VIDEO	CHROMA	Y
REC			
PB			

TO CV-8 BOARD (1/3) VIDEO BLOCK
(See Page 118)





• Signal path

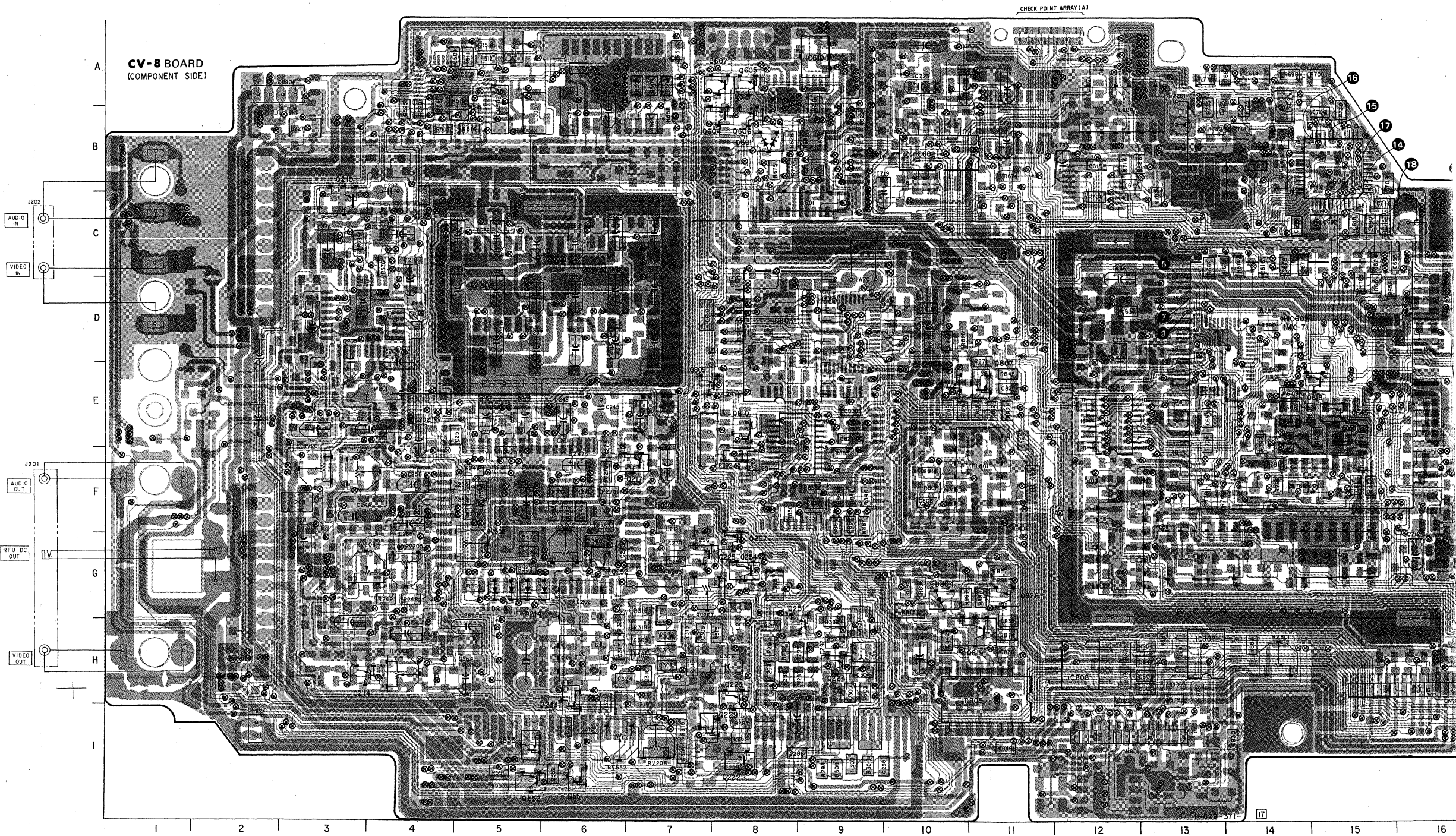
	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC			➡➡➡	
PB				

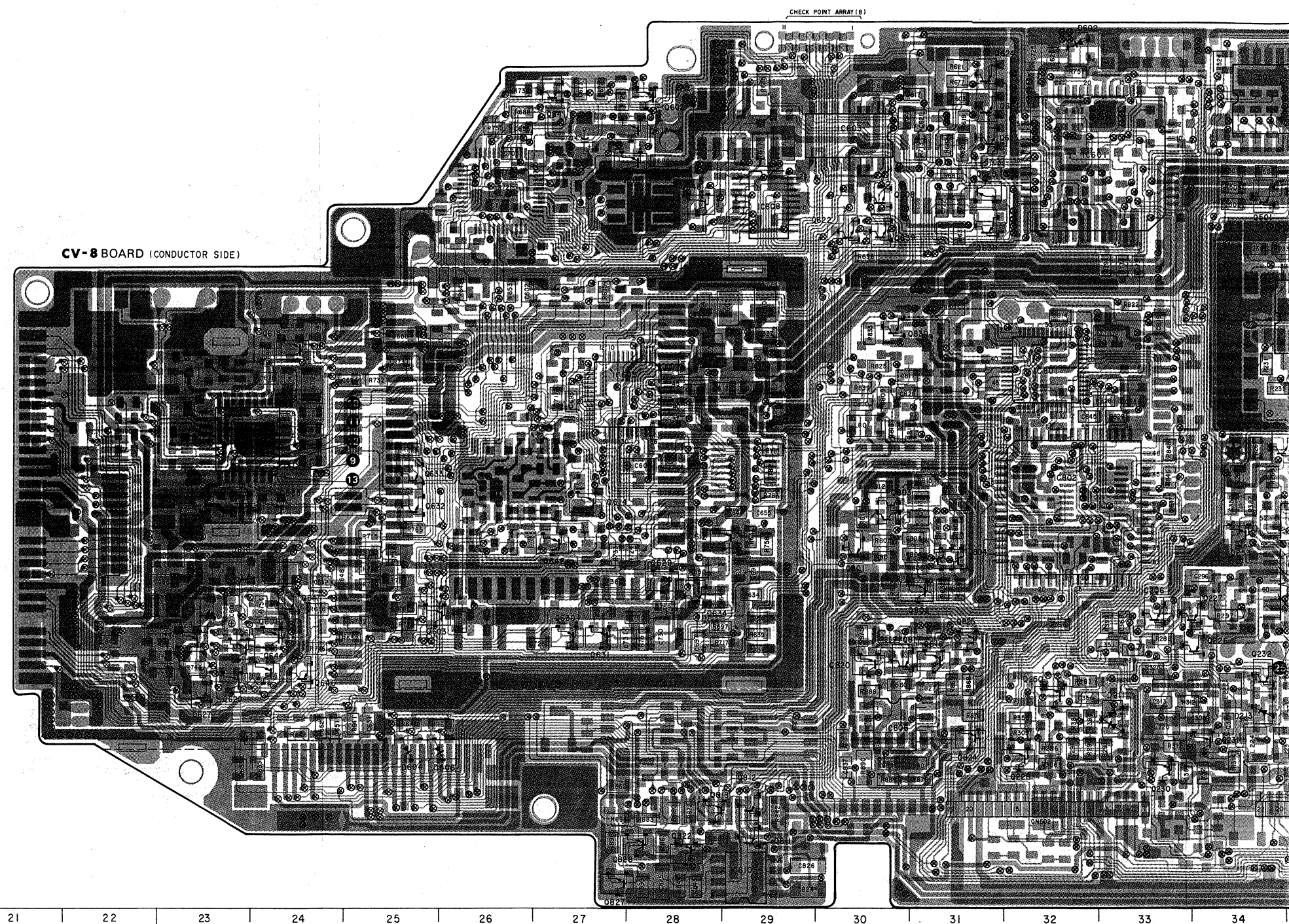
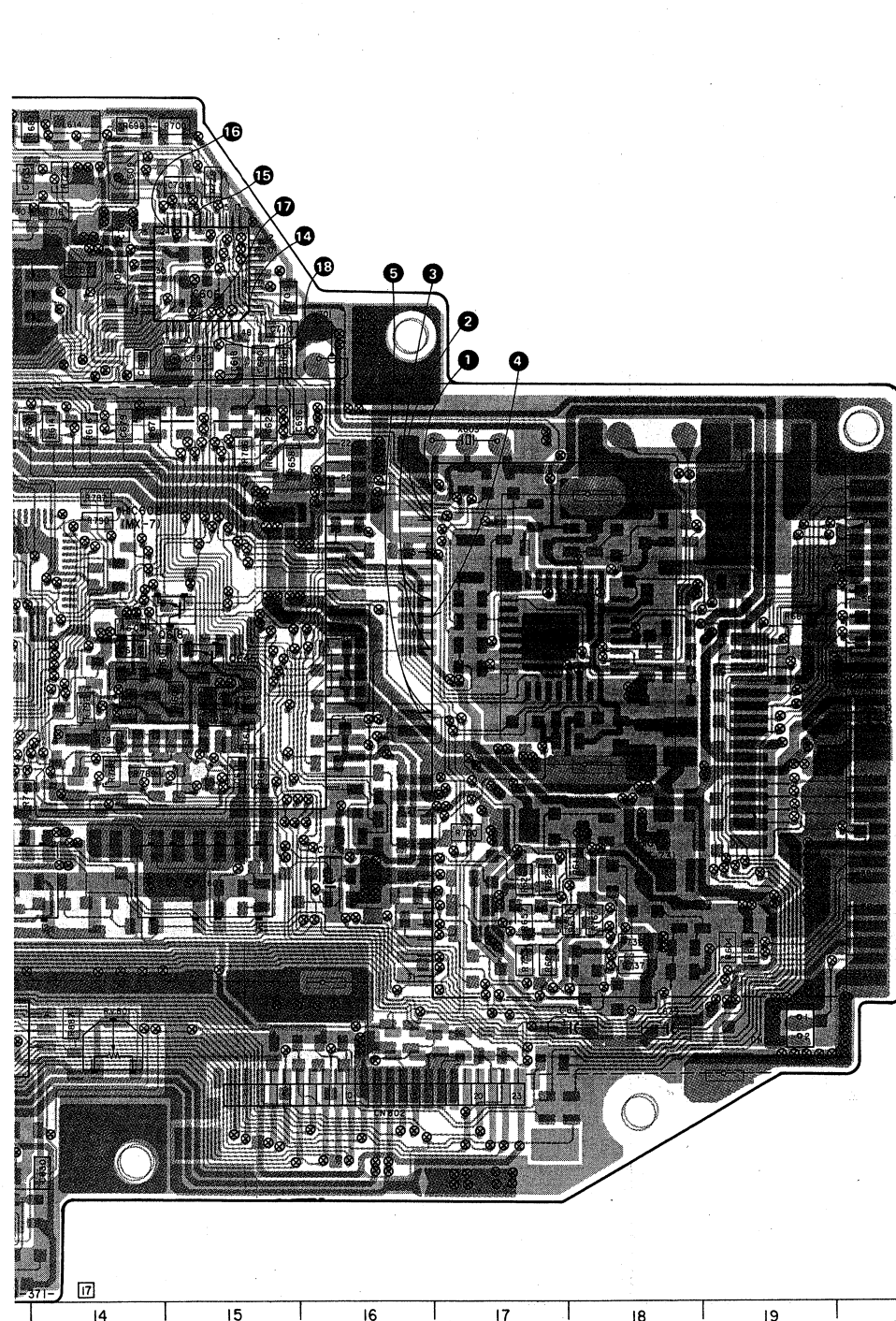
CV-8 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

— Ref. No. CV-8 BOARD: 2000 series —

CV-8 BOARD

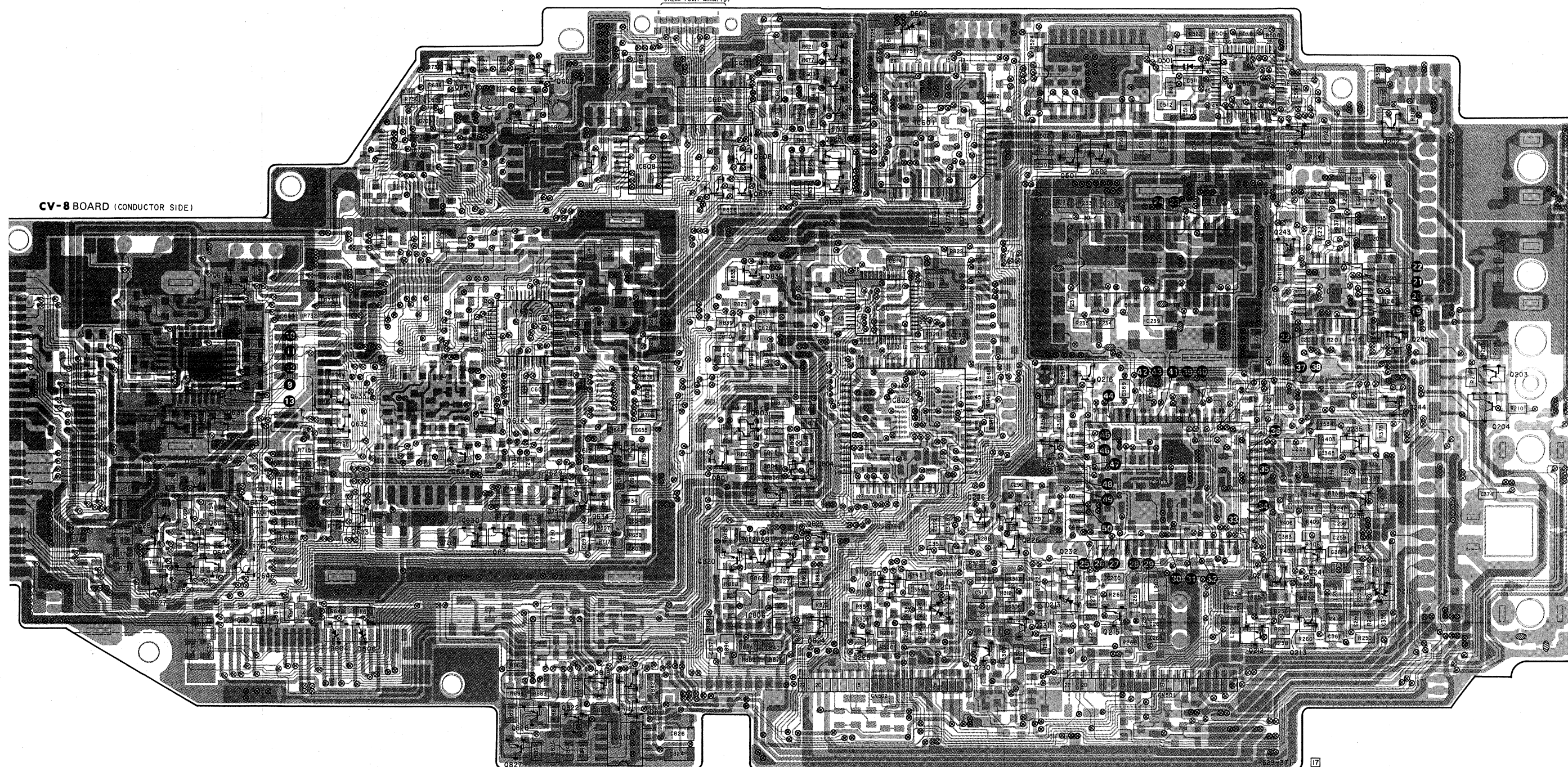
D210	H-38	Q807	A-8
D211	H-33	Q808	B-30
D213	H-34	Q809	G-24
D214	G-5	Q810	F-23
D215	G-5	Q811	G-23
D501	A-36	Q812	F-28
D601	B-8	Q814	F-27
D602	A-32	Q815	D-24
D604	H-25	Q817	B-28
D606	H-26	Q818	E-15
D804	G-10	Q819	B-28
		Q820	H-23
IC201	D-38	Q821	A-31
IC202	D-35	Q822	C-30
IC203	F-35	Q823	B-31
IC501	A-34	Q824	A-31
IC502	A-36	Q825	B-31
IC601	B-32	Q826	G-23
IC602	B-10	Q827	H-23
IC603	B-30	Q828	G-23
IC604	E-23	Q829	F-28
IC605	D-27	Q830	G-27
IC606	B-15	Q831	G-27
IC608	B-29	Q832	F-25
IC609	E-12	Q833	E-25
IC610	A-9	Q834	G-28
IC801	D-32	Q835	F-24
IC802	E-32	Q838	C-31
IC803	D-8	Q839	C-30
IC804	E-8	Q841	A-27
IC805	H-11	Q842	F-27
IC806	H-30	Q844	G-24
IC807	H-13	Q845	E-15
IC808	H-12	Q846	G-24
IC810	I-29	Q847	G-24
		Q848	B-28
Q202	B-38	Q801	F-30
Q203	E-40	Q802	G-31
Q204	E-39	Q803	F-30
Q206	G-33	Q804	F-31
Q207	G-8	Q806	E-10
Q210	C-3	Q807	E-11
Q211	G-37	Q809	E-7
Q212	H-37	Q810	E-8
Q213	H-37	Q811	I-29
Q214	H-3	Q812	I-29
Q215	H-35	Q816	G-31
Q216	E-35	Q817	G-31
Q217	F-7	Q818	I-28
Q222	I-8	Q819	H-12
Q223	H-8	Q820	G-30
Q224	H-9	Q822	I-28
Q225	G-8	Q824	H-31
Q226	G-34	Q825	G-31
Q227	G-34	Q826	G-11
Q228	H-32	Q827	I-27
Q229	H-8	Q828	I-28
Q230	H-33	Q830	D-30
Q231	H-34		
Q232	G-34		
Q233	I-6		
Q235	F-38		
Q236	G-38		
Q241	G-37		
Q243	C-37		
Q244	E-38		
Q245	E-38		
Q250	H-32		
Q251	H-9		
Q252	G-6		
Q253	F-34		
Q254	G-8		
Q501	B-34		
Q502	B-35		
Q503	B-37		
Q551	I-6		
Q552	I-5		
Q553	I-5		
Q602	A-28		
Q603	G-25		
Q604	B-8		
Q605	A-8		
Q606	B-8		





CHECK POINT ARRAY (B)

CV-8 BOARD (CONDUCTOR SIDE)



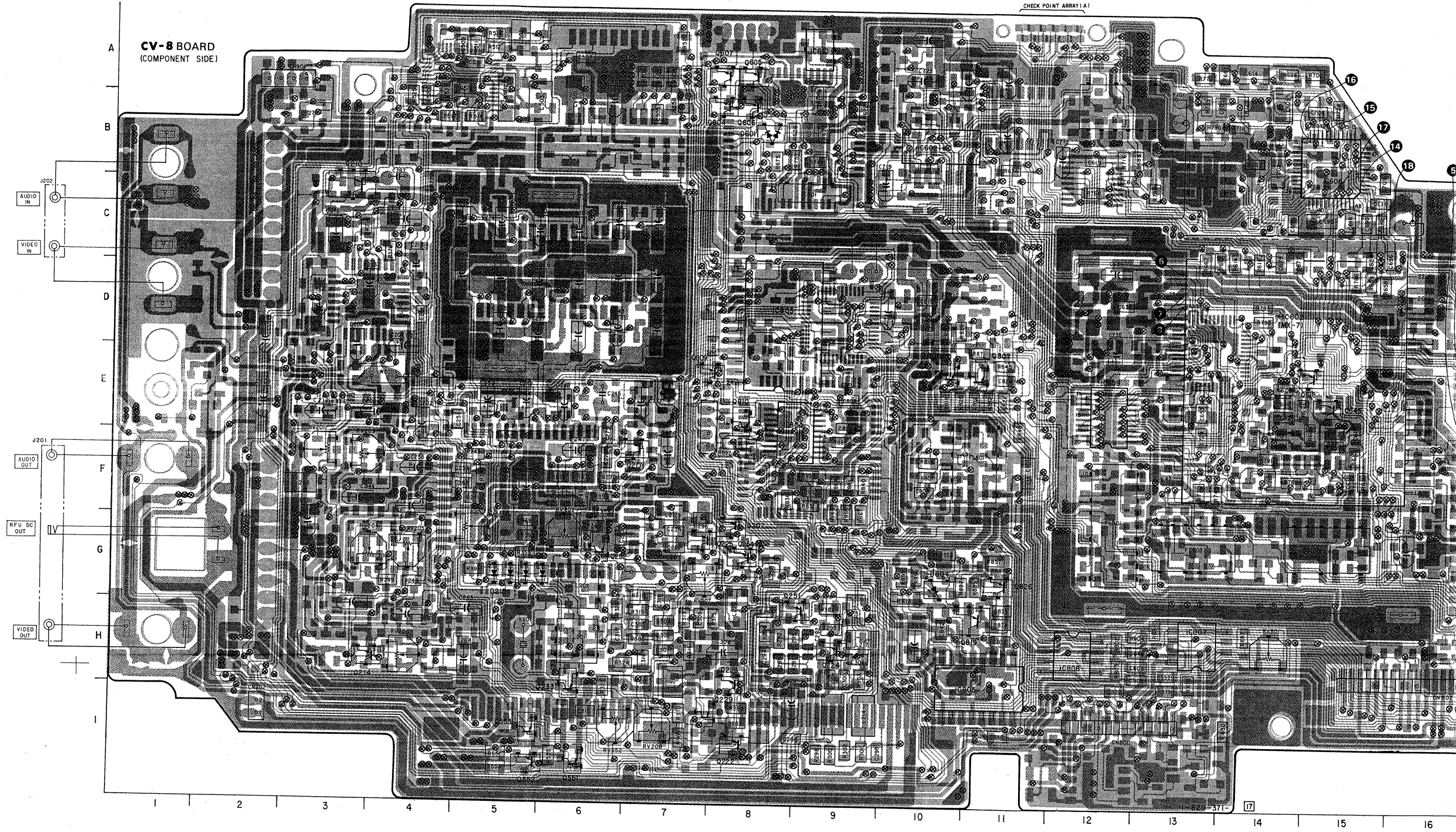
22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

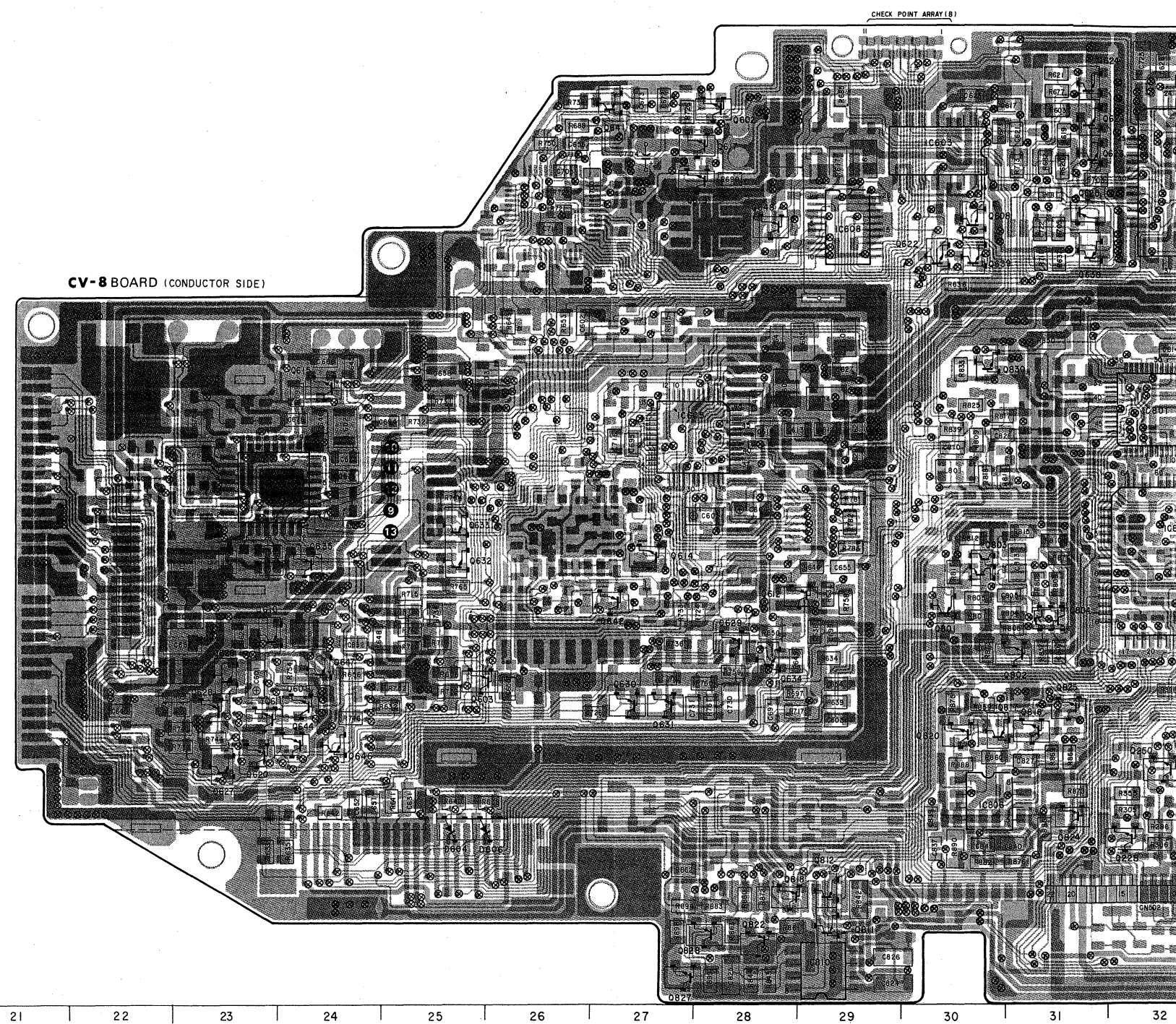
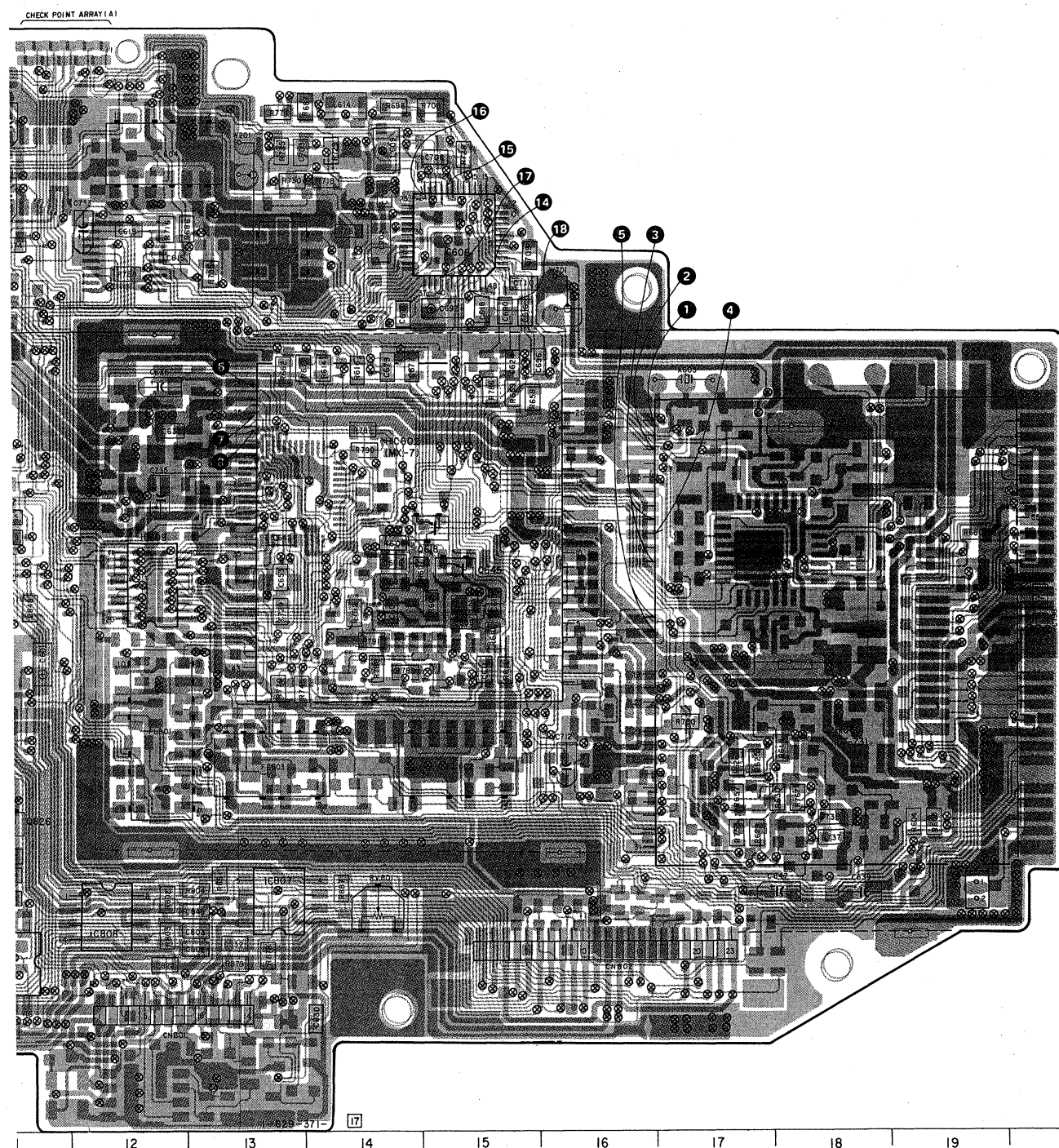
CV-8 (CAMERA, VIDEO PROCESS) PRINTED WIRING BOARDS

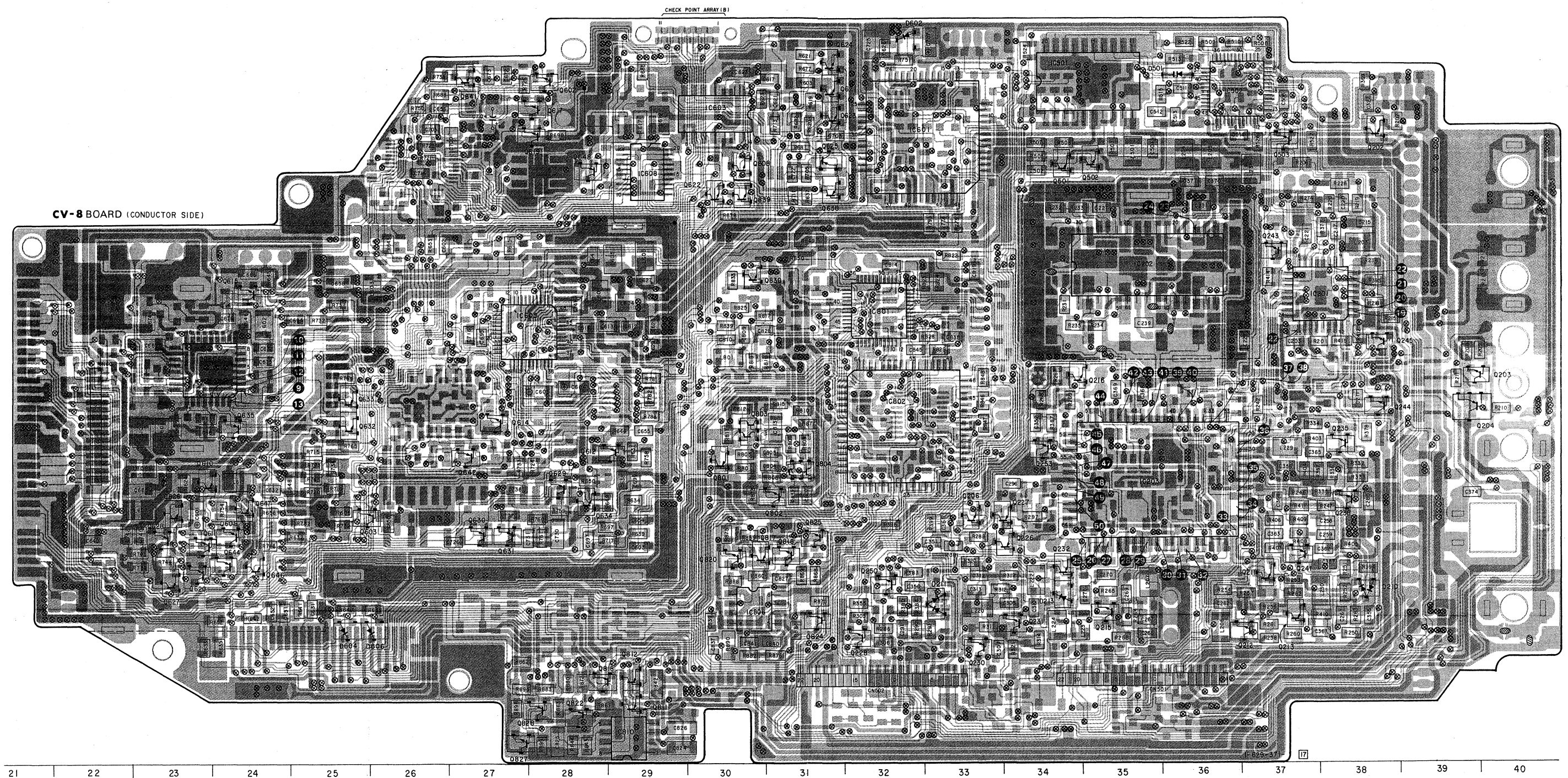
— Ref. No. CV-8 BOARD: 2000 series —

CV-8 BOARD

D210	H-38	Q607	A-8
D211	H-33	Q608	B-30
D213	H-34	Q609	G-24
D214	G-5	Q610	F-23
D215	G-5	Q611	G-23
D501	A-36	Q612	F-28
D601	B-8	Q614	F-27
D602	A-32	Q615	D-24
D604	H-25	Q617	B-28
D606	H-26	Q618	E-15
D804	G-10	Q619	B-28
		Q620	H-23
IC201	D-38	Q621	A-31
IC202	D-35	Q622	C-30
IC203	F-35	Q623	B-31
IC501	A-34	Q624	A-31
IC502	A-36	Q625	B-31
IC601	B-32	Q626	G-23
IC602	B-10	Q627	H-23
IC603	B-30	Q628	G-23
IC604	E-23	Q629	F-28
IC605	D-27	Q630	G-27
IC606	B-15	Q631	G-27
IC608	B-29	Q632	F-25
IC609	E-12	Q633	E-25
IC610	A-9	Q634	G-28
IC801	D-32	Q635	F-24
IC802	E-32	Q638	C-31
IC803	D-8	Q639	C-30
IC804	E-8	Q641	A-27
IC805	H-11	Q642	F-27
IC806	H-30	Q644	G-24
IC807	H-13	Q645	E-15
IC808	H-12	Q646	G-24
IC810	I-29	Q647	G-24
		Q648	B-28
Q202	B-38	Q801	F-30
Q203	E-40	Q802	G-31
Q204	E-39	Q803	F-30
Q206	G-33	Q804	F-31
Q207	G-8	Q806	E-10
Q210	C-3	Q807	E-11
Q211	G-37	Q809	E-7
Q212	H-37	Q810	E-8
Q213	H-37	Q811	I-29
Q214	H-3	Q812	I-29
Q215	H-35	Q816	G-31
Q216	E-35	Q817	G-31
Q217	F-7	Q818	I-28
Q222	I-8	Q819	H-12
Q223	H-8	Q820	G-30
Q224	H-9	Q822	I-28
Q225	G-8	Q824	H-31
Q226	G-34	Q825	G-31
Q227	G-34	Q826	G-11
Q228	H-32	Q827	I-27
Q229	I-8	Q828	I-28
Q230	H-33	Q830	D-30
Q231	H-34		
Q232	G-34		
Q233	I-6		
Q235	F-38		
Q236	G-38		
Q241	G-37		
Q243	C-37		
Q244	E-38		
Q245	E-38		
Q250	H-32		
Q251	H-9		
Q252	G-6		
Q253	F-34		
Q254	G-8		
Q501	B-34		
Q502	B-35		
Q503	B-37		
Q551	I-6		
Q552	I-5		
Q553	I-5		
Q602	A-28		
Q603	G-25		
Q604	B-8		
Q605	A-8		
Q606	B-8		



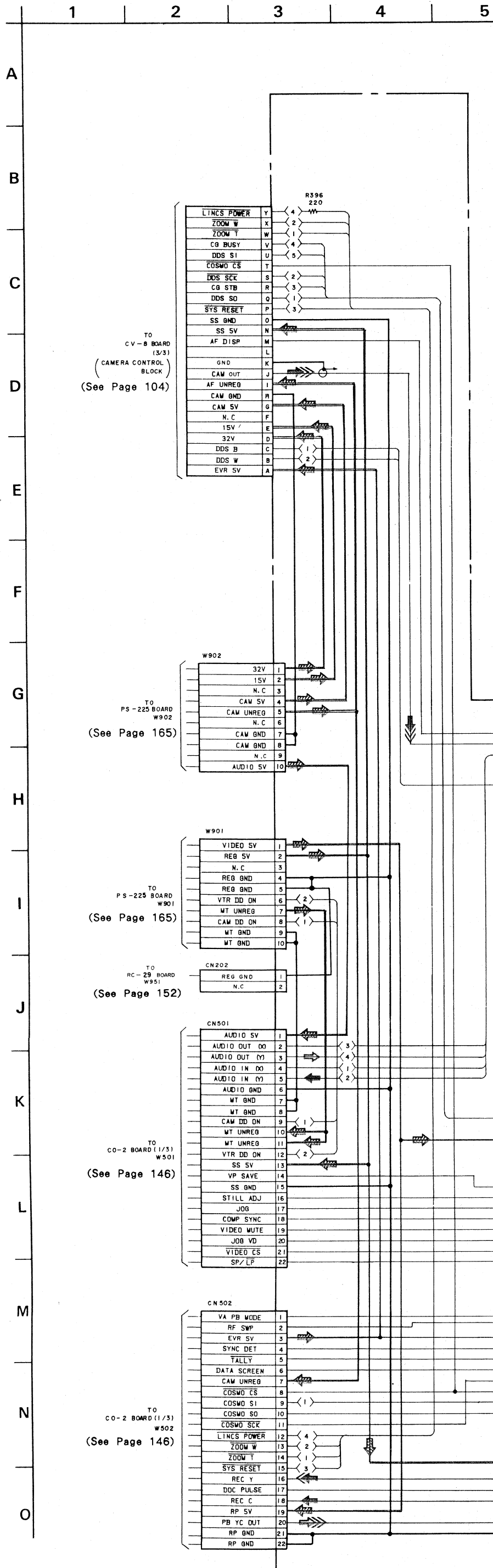
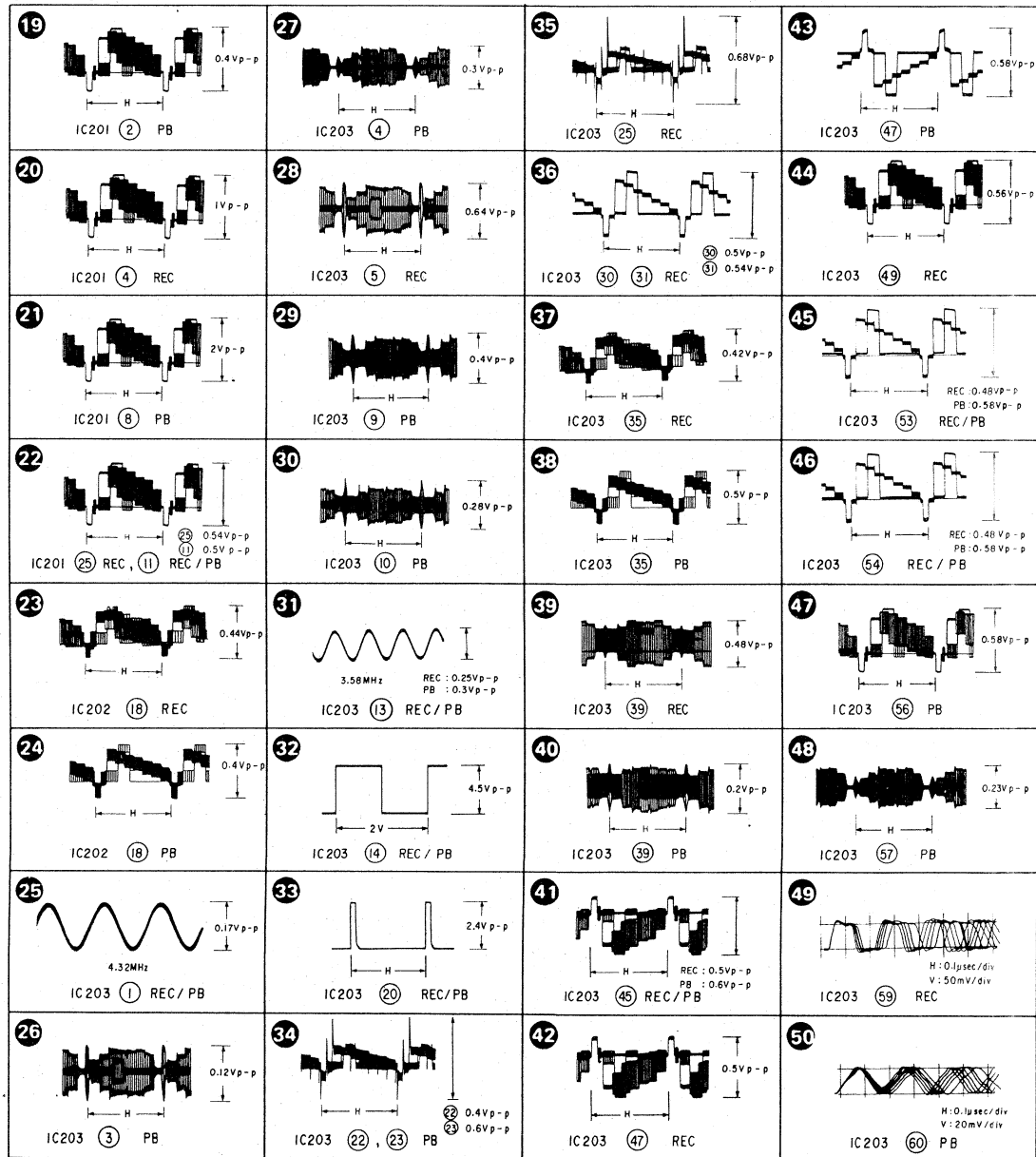


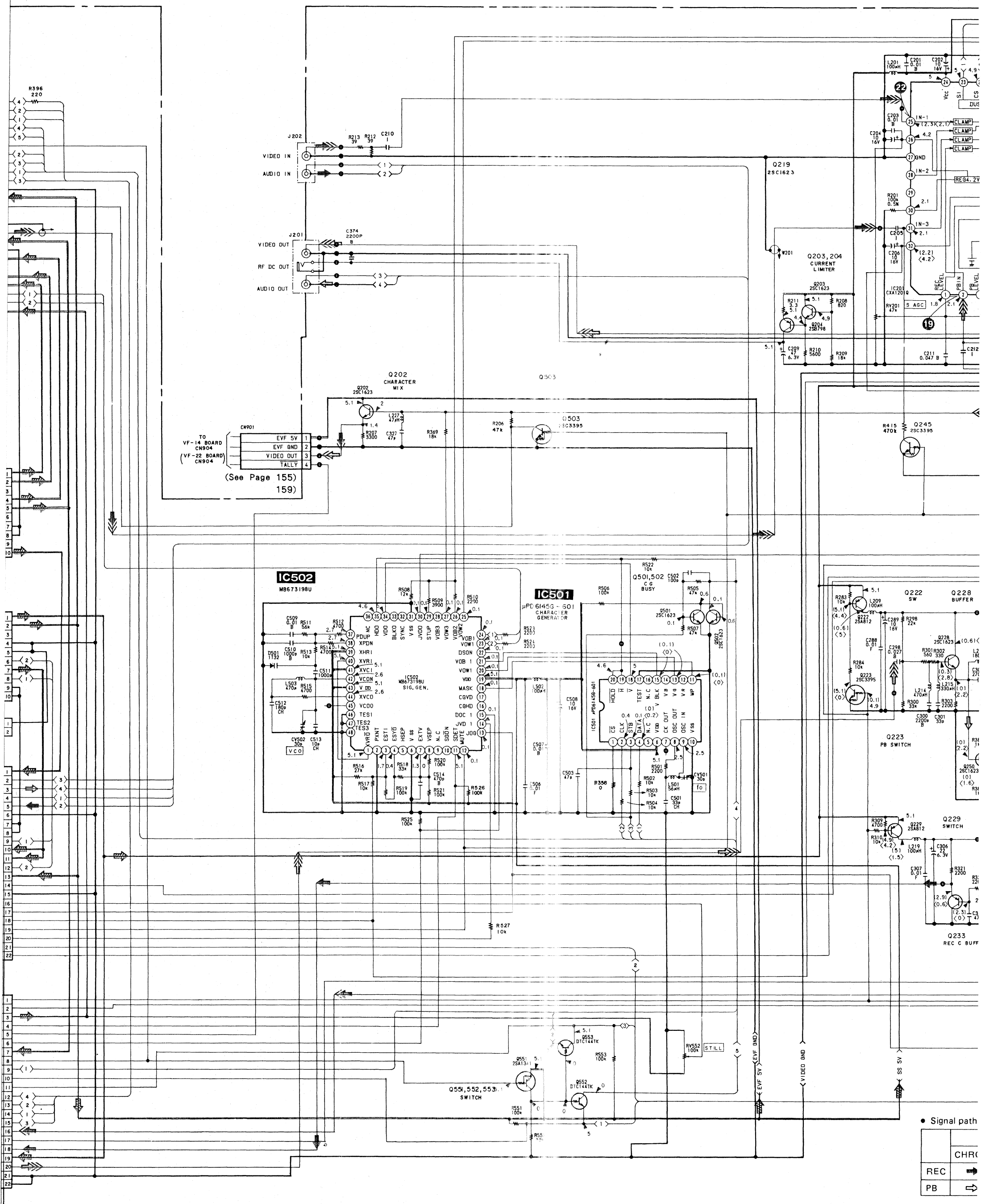


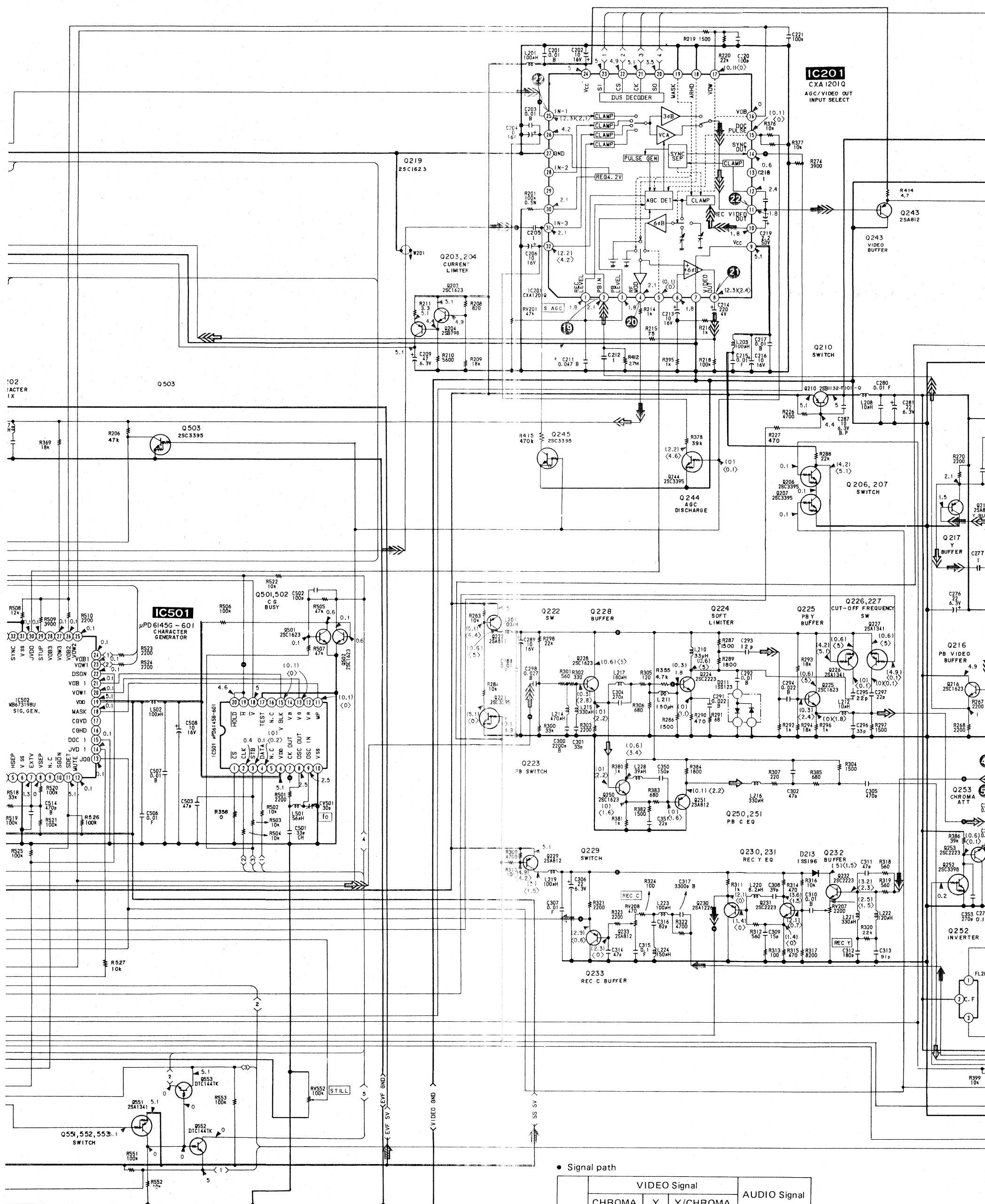
CV-8 (VIDEO PROCESS) SCHEMATIC DIAGRAMS

— Ref. No. CV-8 BOARD: 2000 series —

CV-8 BOARD (VIDEO)

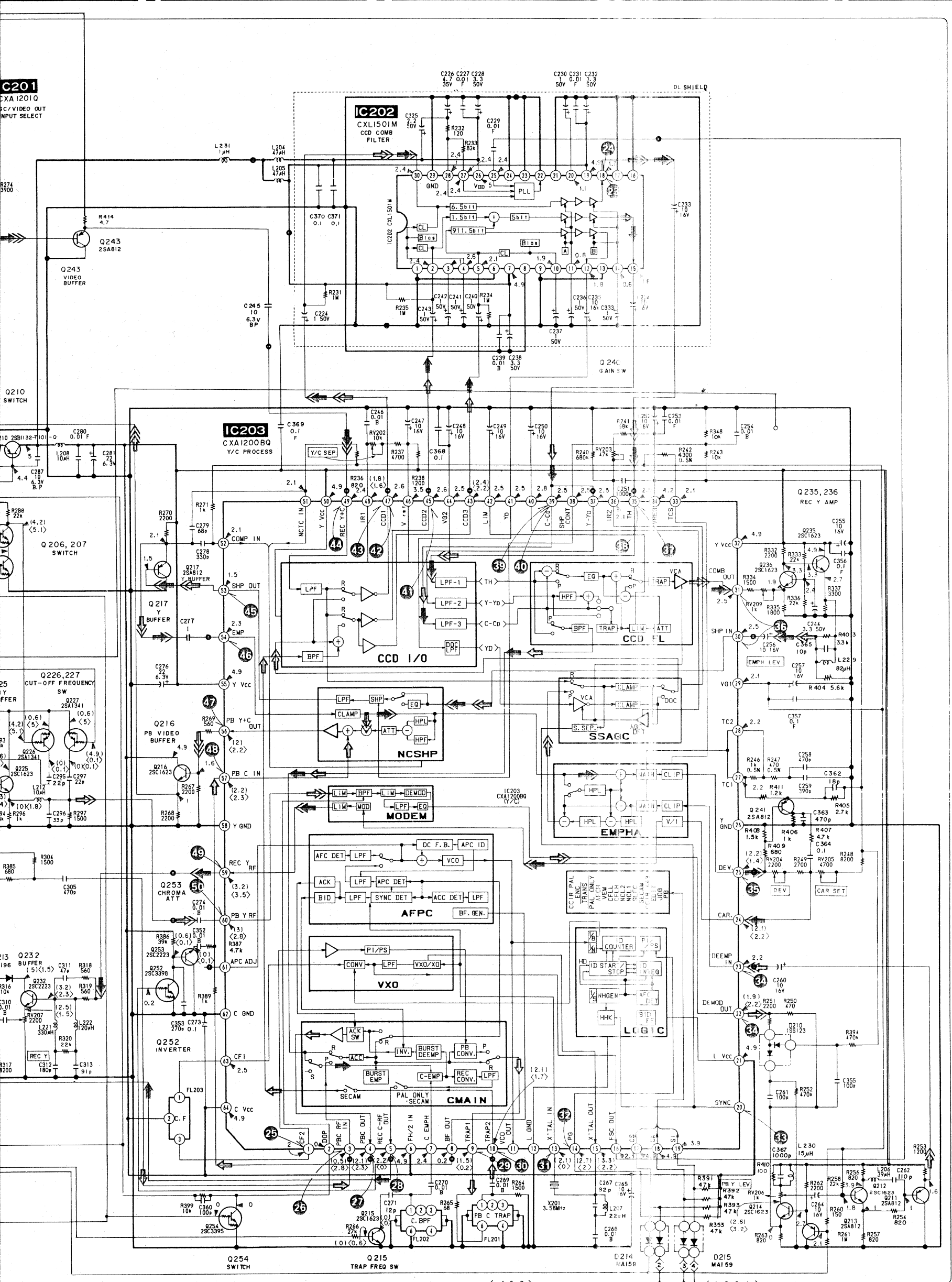






• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	→
PB	→	→	→	→



no mark: REC/PB mode
(): REC mode
< >: PB mode

Q213, 214
HALF H SHIFT
CANCEL

Q211, 212
PB Y EQ

CV-8 BOARD (1/3) (VIDEO BLOCK)

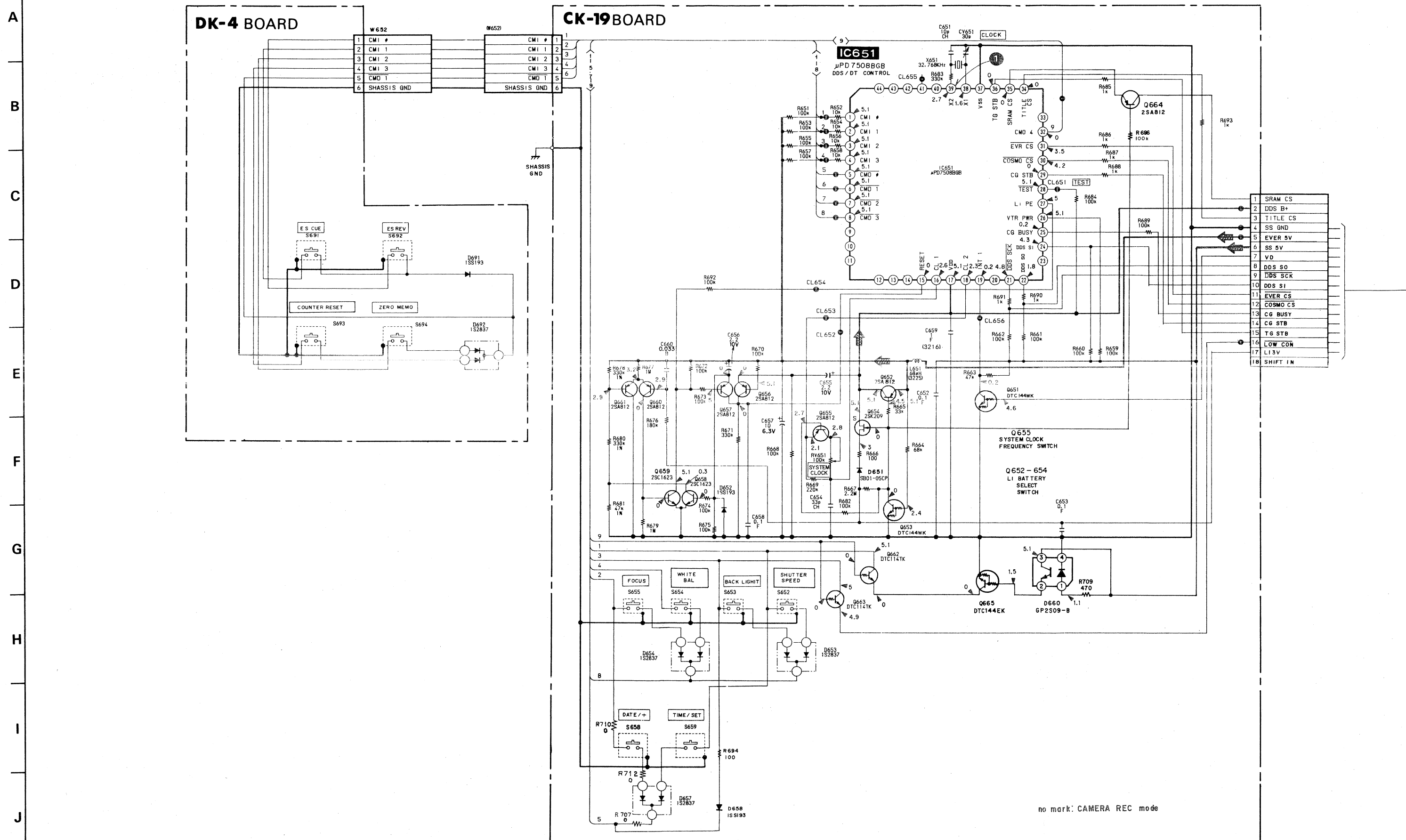
— Ref. No. LI-5 BOARD: 3000 series, CK-19 BOARD: 4000 series, DK-4 BOARD: 5000 series —

D651	C-11
D652	C-10
D653	A-5
D654	A-5
D657	B-2
D658	C-4
D660	A-4
IC651	C-3
Q651	A-4
Q652	C-2
Q653	A-2
Q654	C-13
Q655	C-12
Q656	C-11
Q657	C-11
Q658	B-10
Q659	B-10
Q660	C-9
Q661	C-9
Q662	B-13
Q663	A-2
Q664	A-13
Q665	B-13

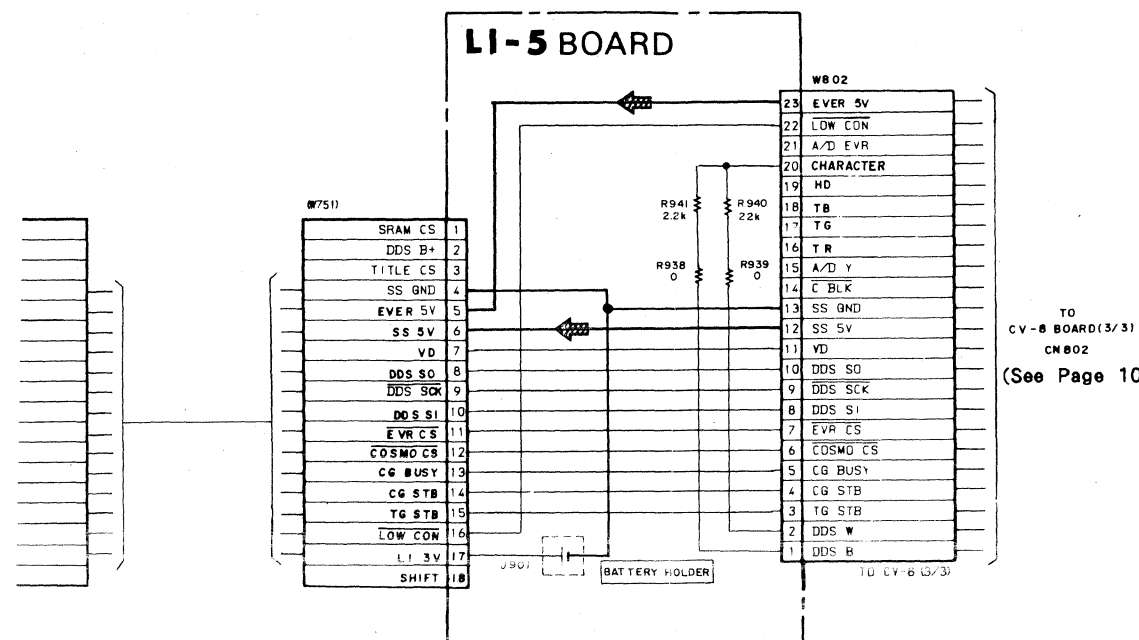
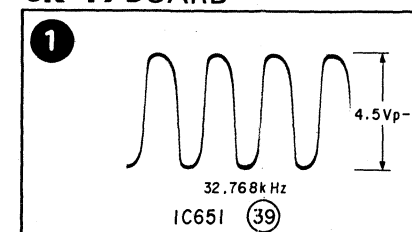
DK-

LI-5 (RELAY), CK-19 (TITLE CONTROL, CAMERA FUNCTION SWITCH), DK-4 (EDIT SEARCH SWITCH) SCHEMATIC DIAGRAMS

—Ref. No. LI-5 BOARD: 3000 series, CK-19 BOARD: 4000 series, DK-4 BOARD: 5000 series—



CK-19 BOARD

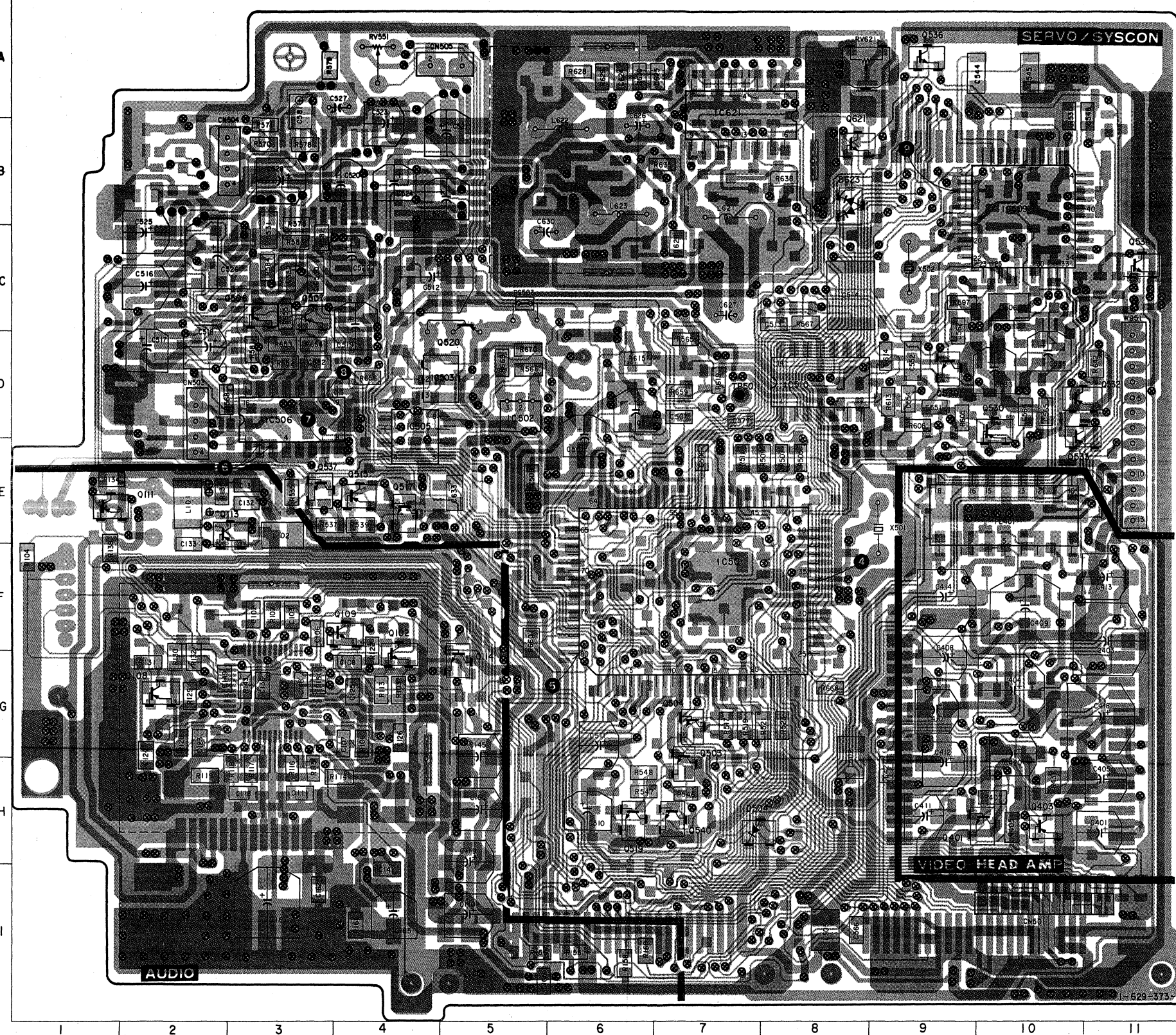


CO-2 (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL), CC-26 (TFG/SFG AMP),
KS-6 (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR),
FP-90 (TAPE TOP SENSOR) PRINTED WIRING BOARDS

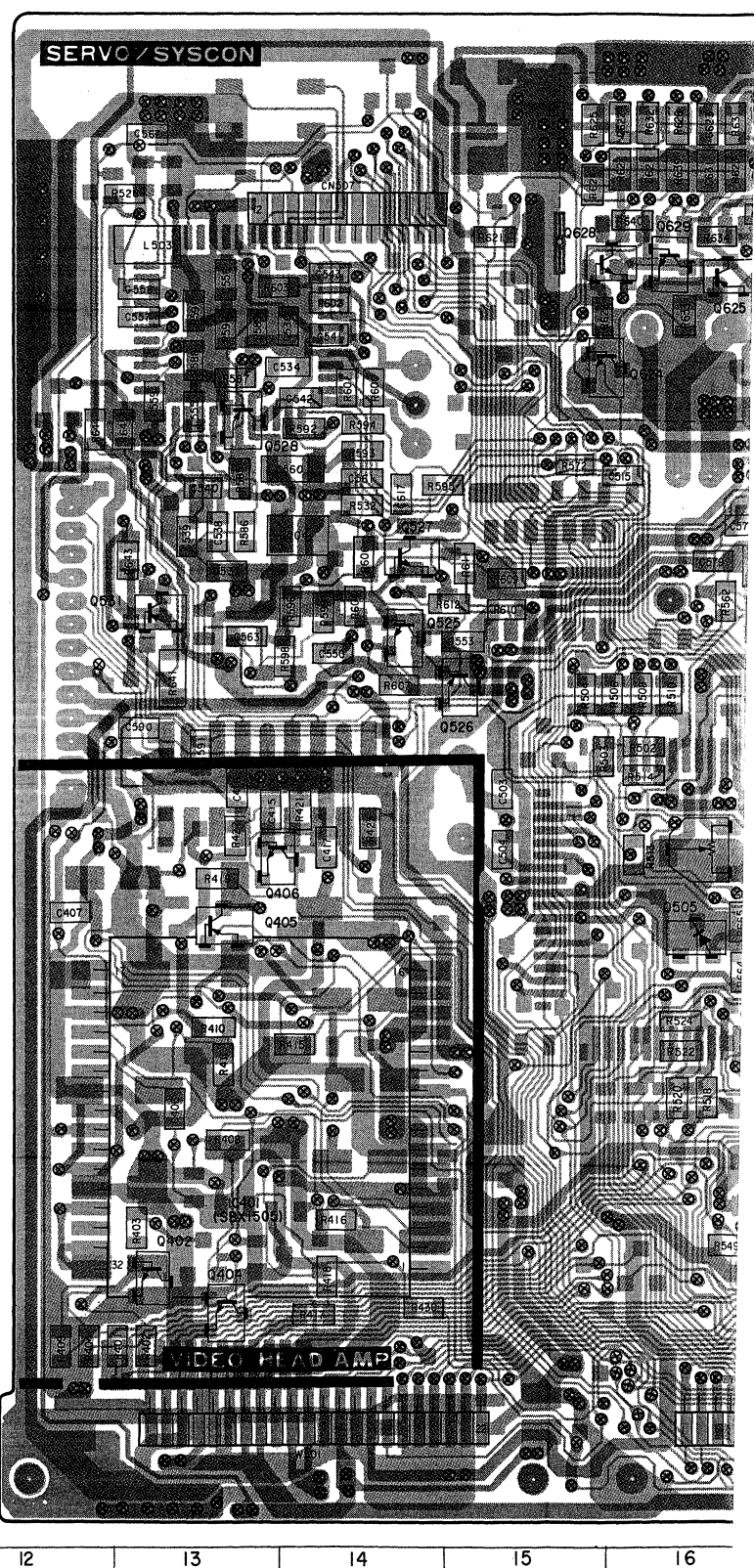
— Ref. No. CO-2 BOARD: 6000 series —

CO-2 BOARD	
D504	H-8
D505	F-16
D621	A-18
D622	B-18
D623	B-8
IC101	G-20
IC401	G-13
IC501	F-7
IC502	D-5
IC503	D-5
IC504	B-19
IC505	D-4
IC506	D-3
IC507	B-20
IC508	C-20
IC509	B-10
IC510	D-8
IC621	A-7
Q102	F-4
Q108	G-2
Q109	F-4
Q110	F-19
Q111	E-1
Q112	E-21
Q113	E-3
Q114	G-5
Q116	G-18
Q401	H-10
Q402	H-13
Q403	H-10
Q404	H-13
Q405	F-13
Q406	F-13
Q503	H-7
Q504	G-7
Q506	C-3
Q507	C-3
Q515	E-4
Q516	E-19
Q517	E-4
Q518	H-17
Q519	H-6
Q520	D-5
Q521	D-19
Q522	B-21
Q524	D-17
Q525	D-14
Q526	E-15
Q527	J-14
Q528	C-13
Q529	D-9
Q530	D-10
Q531	D-13
Q532	D-11
Q533	E-10
Q534	C-11
Q535	B-21
Q536	A-9
Q537	E-3
Q538	E-19
Q539	H-17
Q540	H-7
Q621	B-8
Q622	A-17
Q623	A-17
Q624	C-16
Q625	B-16
Q626	B-17
Q627	B-17
Q628	B-16
Q629	B-16

CO-2 BOARD (COMPONENT SIDE)



CO-2 BOARD (CONDUCTOR SIDE)



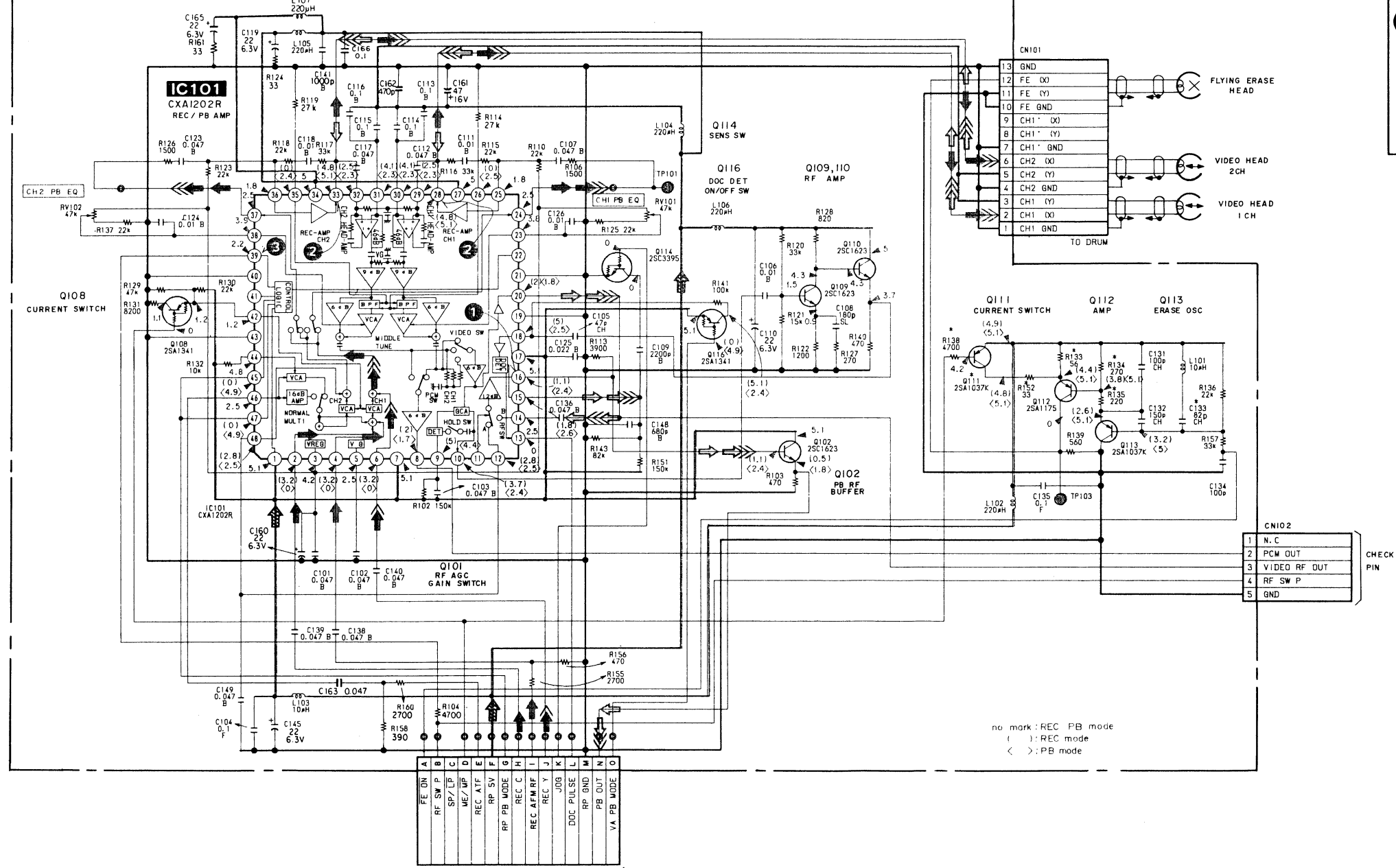
CO-2 (HEAD AMP, AUDIO) SCHEMATIC DIAGRAMS

— Ref. No. CO-2 BOARD: 6000 series —

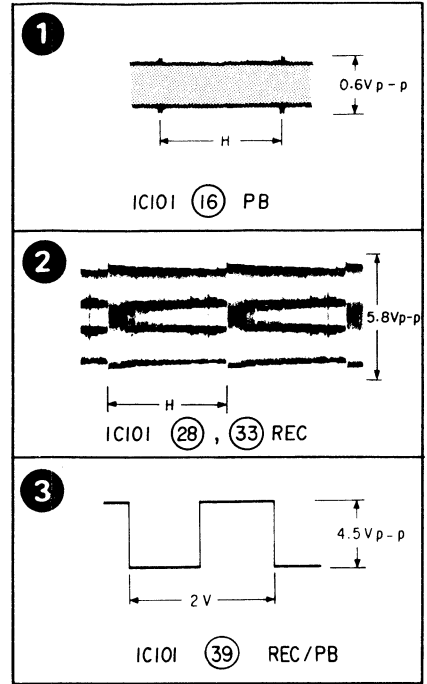
• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	→
PB			→	→

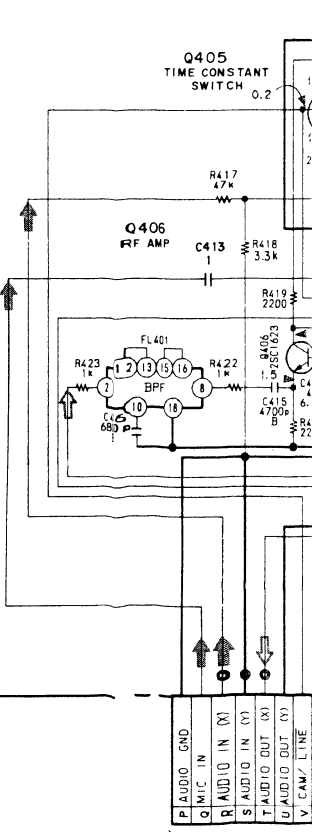
CO-2 BOARD (2/3) VIDEO HEAD AMP BLOCK

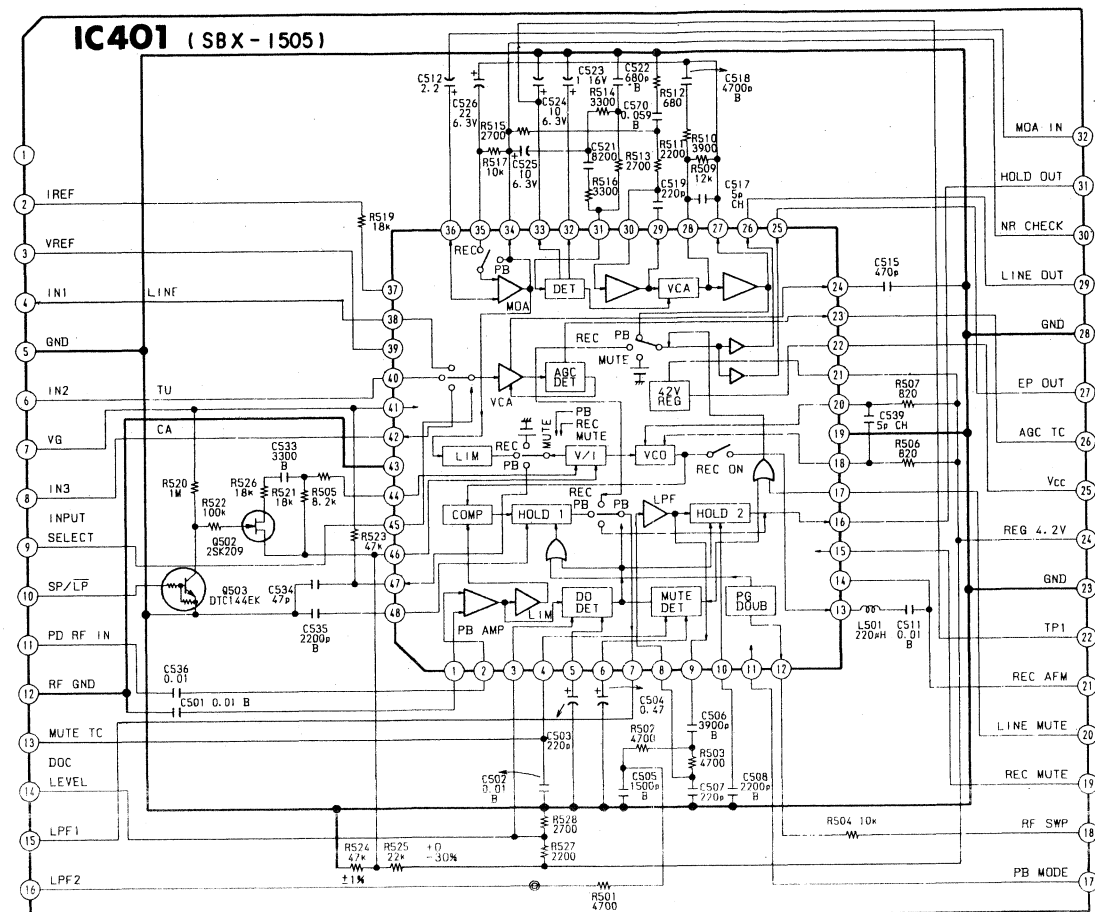


CO-2 BOARD (HEADAMP)



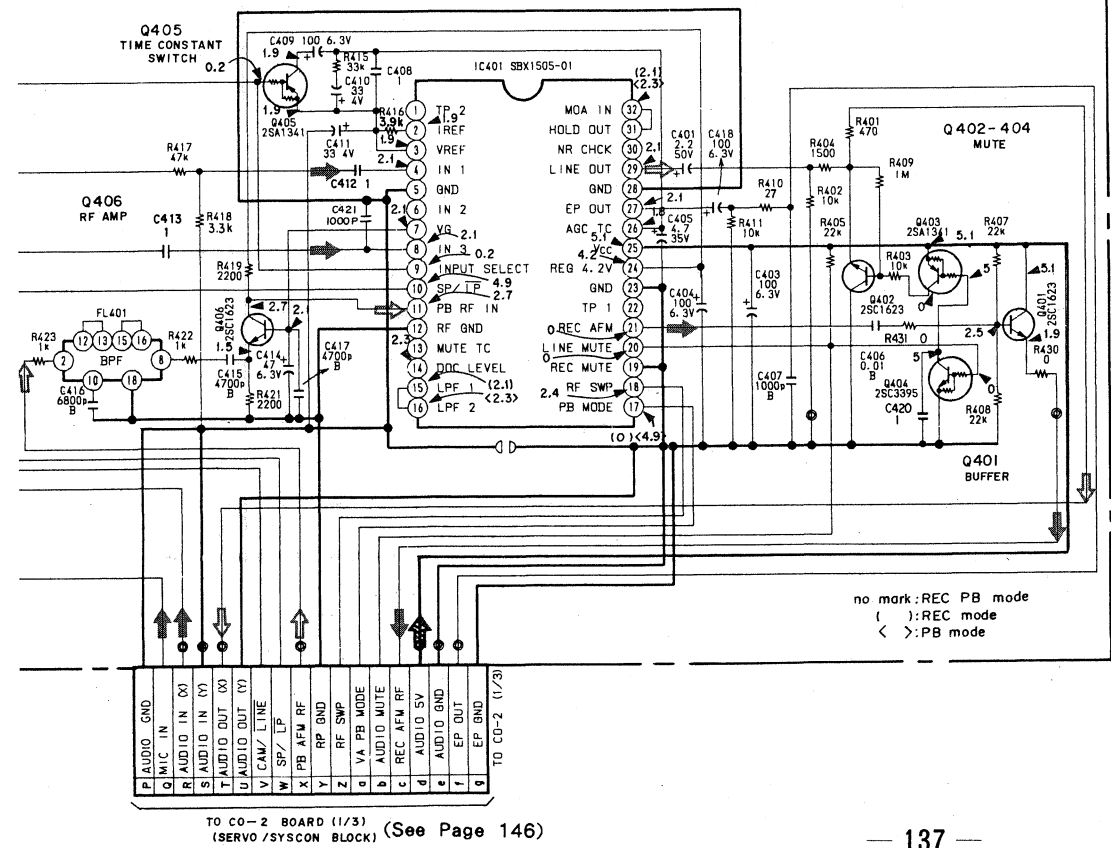
CO-2 BOARD (3/3) AUDIO BLOCK





3/3) AUDIO BLOCK

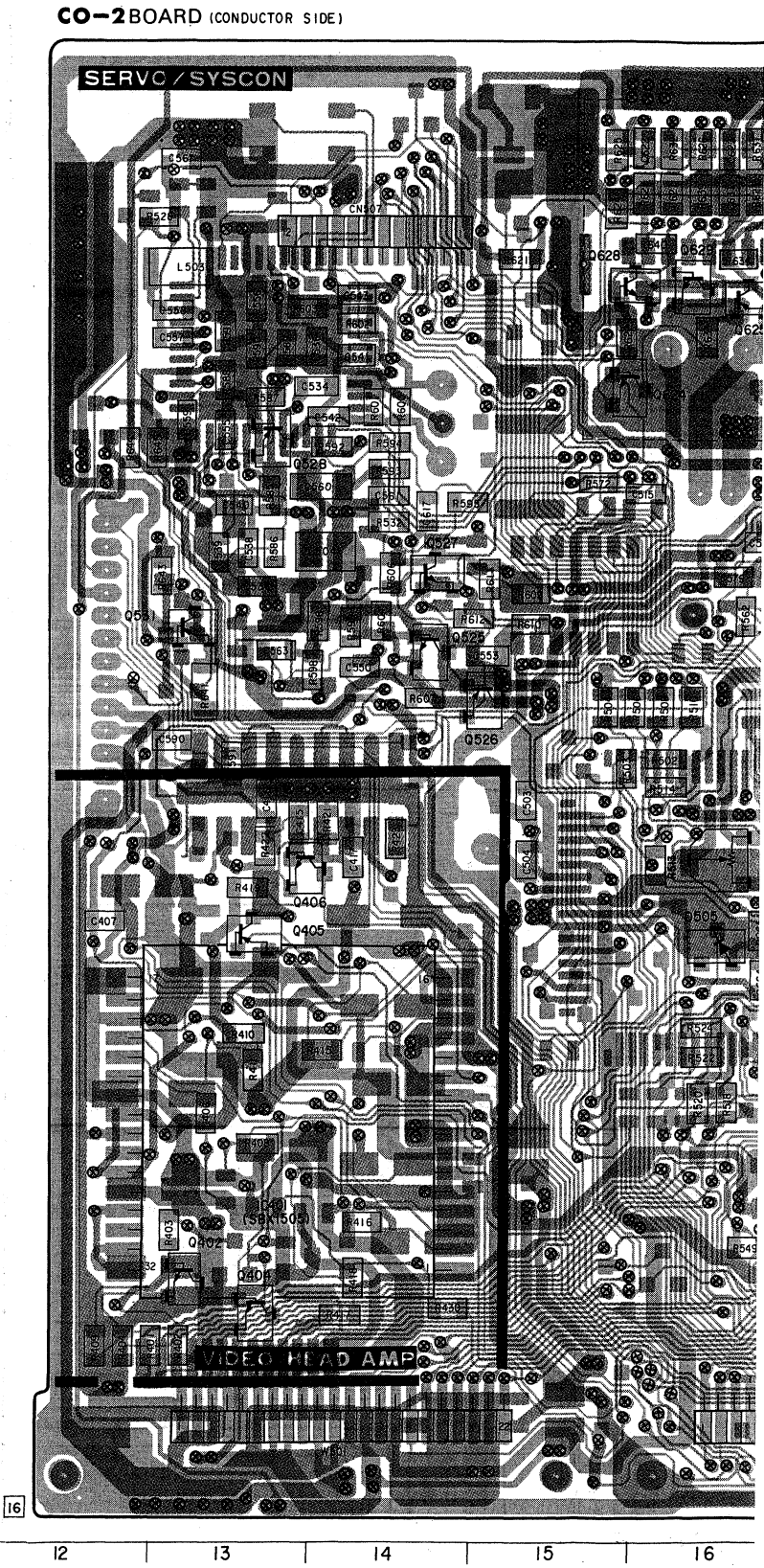
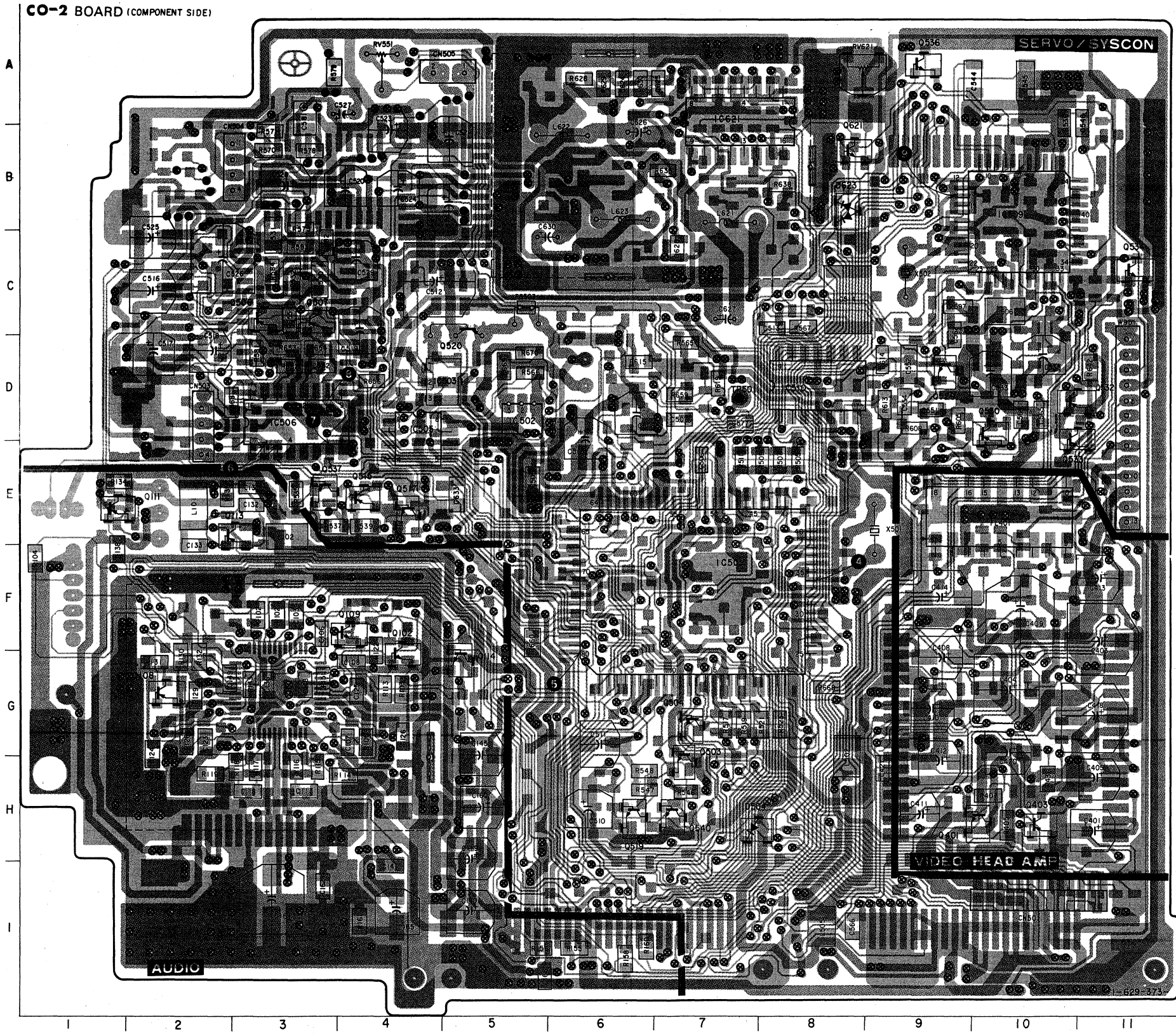
IC401
SBX1505-01
FM MOD / DEMOD
NOISE REDUCTION

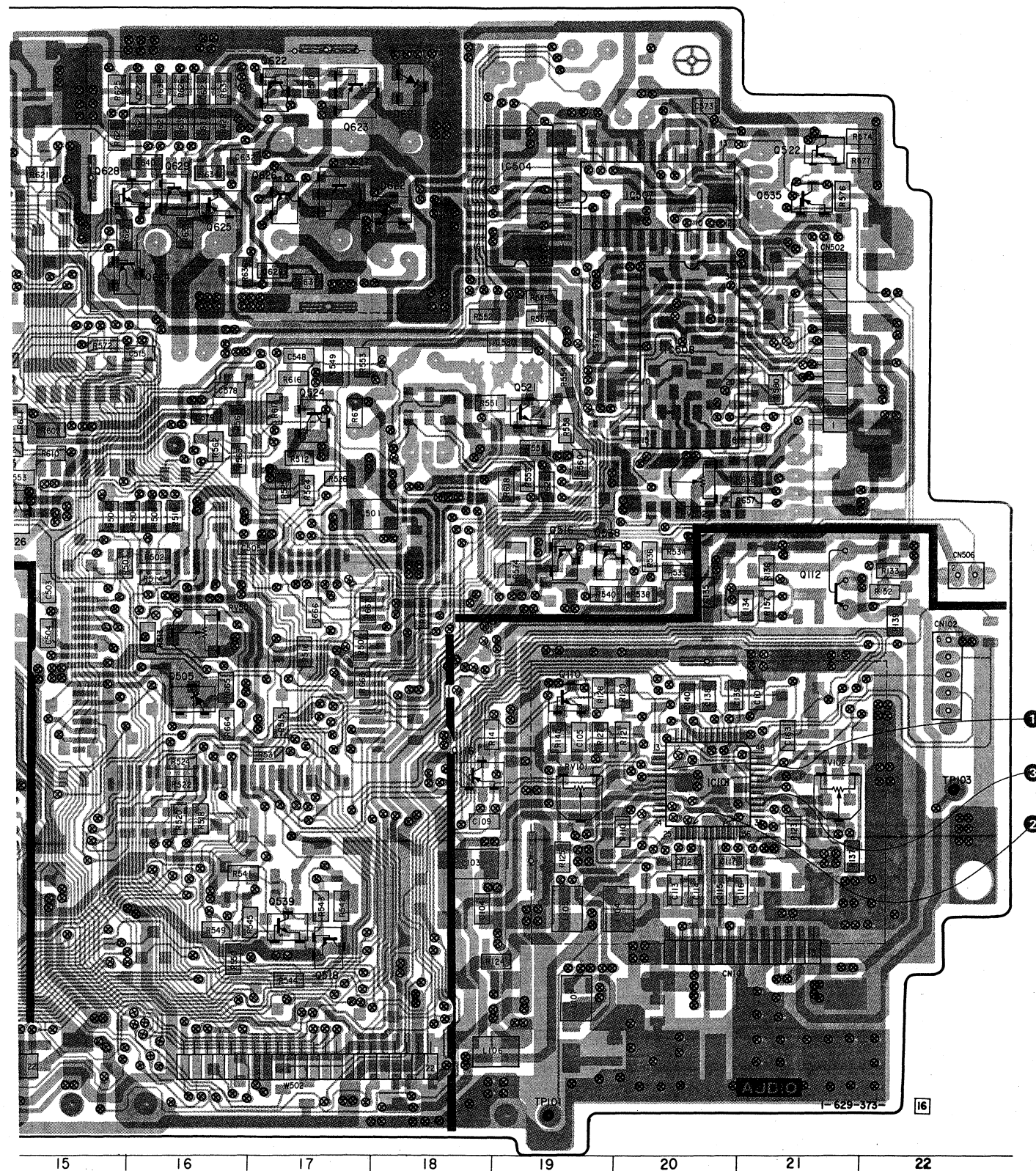


CO-2 (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL), CC-26 (TFG/SFG AMP),
KS-6 (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR),
FP-90 (TAPE TOP SENSOR) SCHEMATIC DIAGRAMS

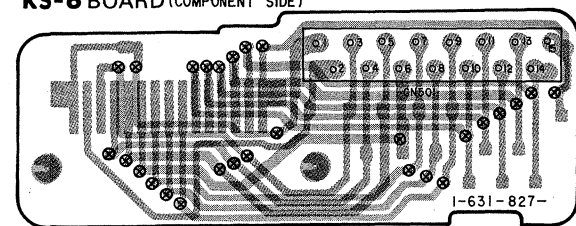
— Ref. No. CO-2, FP-89 BOARDS: 6000 series, CC-26 BOARD: 7000 series, FP-90, KS-6 BOARDS: 8000 series —

CO-2 BOARD	
D504	H-8
D505	F-16
D621	A-18
D622	B-18
D623	B-8
IC101	
IC401	G-20
IC501	G-13
IC502	F-7
IC503	D-5
IC504	D-5
IC505	B-19
IC506	D-4
IC507	D-3
IC508	B-20
IC509	C-20
IC510	B-10
IC511	D-8
IC621	A-7
Q102	
Q108	F-4
Q109	G-2
Q110	F-19
Q111	E-1
Q112	E-21
Q113	E-3
Q114	G-5
Q116	O-18
Q401	H-10
Q402	H-13
Q403	H-10
Q404	H-13
Q405	F-13
Q406	F-13
Q503	H-7
Q504	G-7
Q506	C-3
Q507	C-3
Q515	E-4
Q516	E-19
Q517	E-4
Q518	H-17
Q519	H-6
Q520	D-5
Q521	D-19
Q522	B-21
Q524	D-17
Q525	D-14
Q526	D-15
Q527	D-14
Q528	C-13
Q529	D-9
Q530	D-10
Q531	D-13
Q532	D-11
Q533	E-10
Q534	C-11
Q535	B-21
Q536	A-9
Q537	E-3
Q538	E-19
Q539	H-17
Q540	H-7
Q621	B-8
Q622	A-17
Q623	A-17
Q624	C-16
Q625	B-16
Q626	B-17
Q627	B-17
Q628	B-16
Q629	B-16

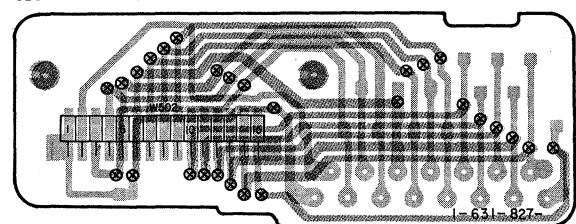




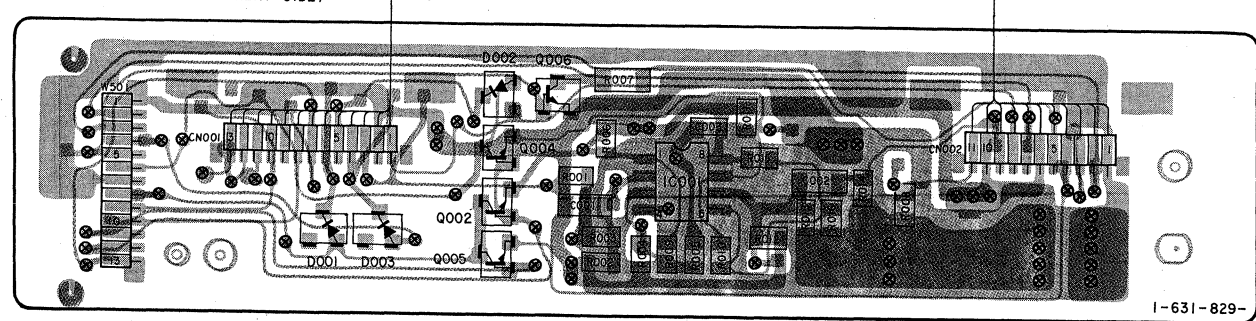
KS-6 BOARD (COMPONENT SIDE)



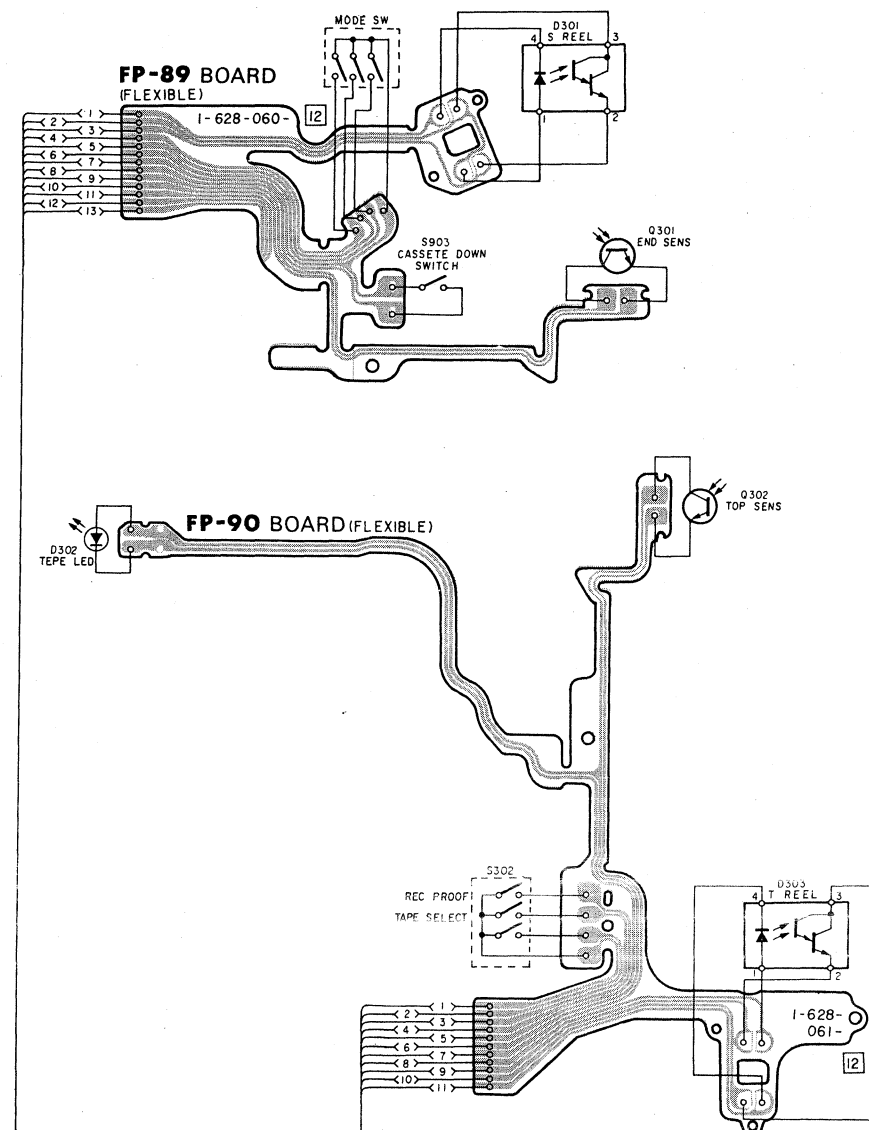
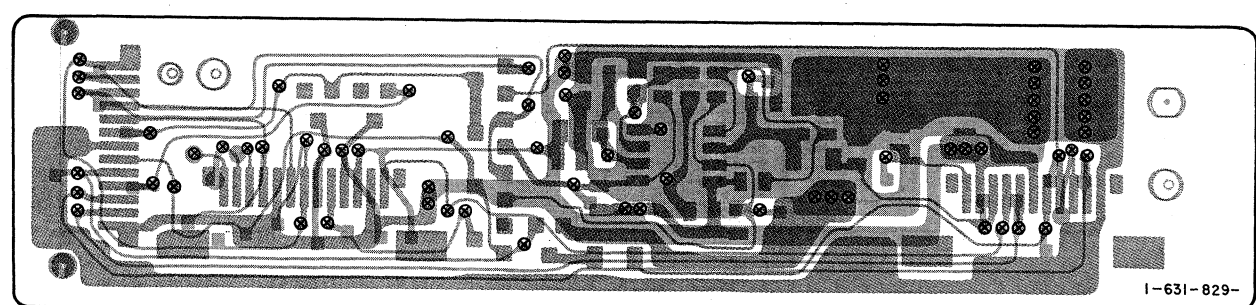
KS-6 BOARD (CONDUCTOR SIDE)



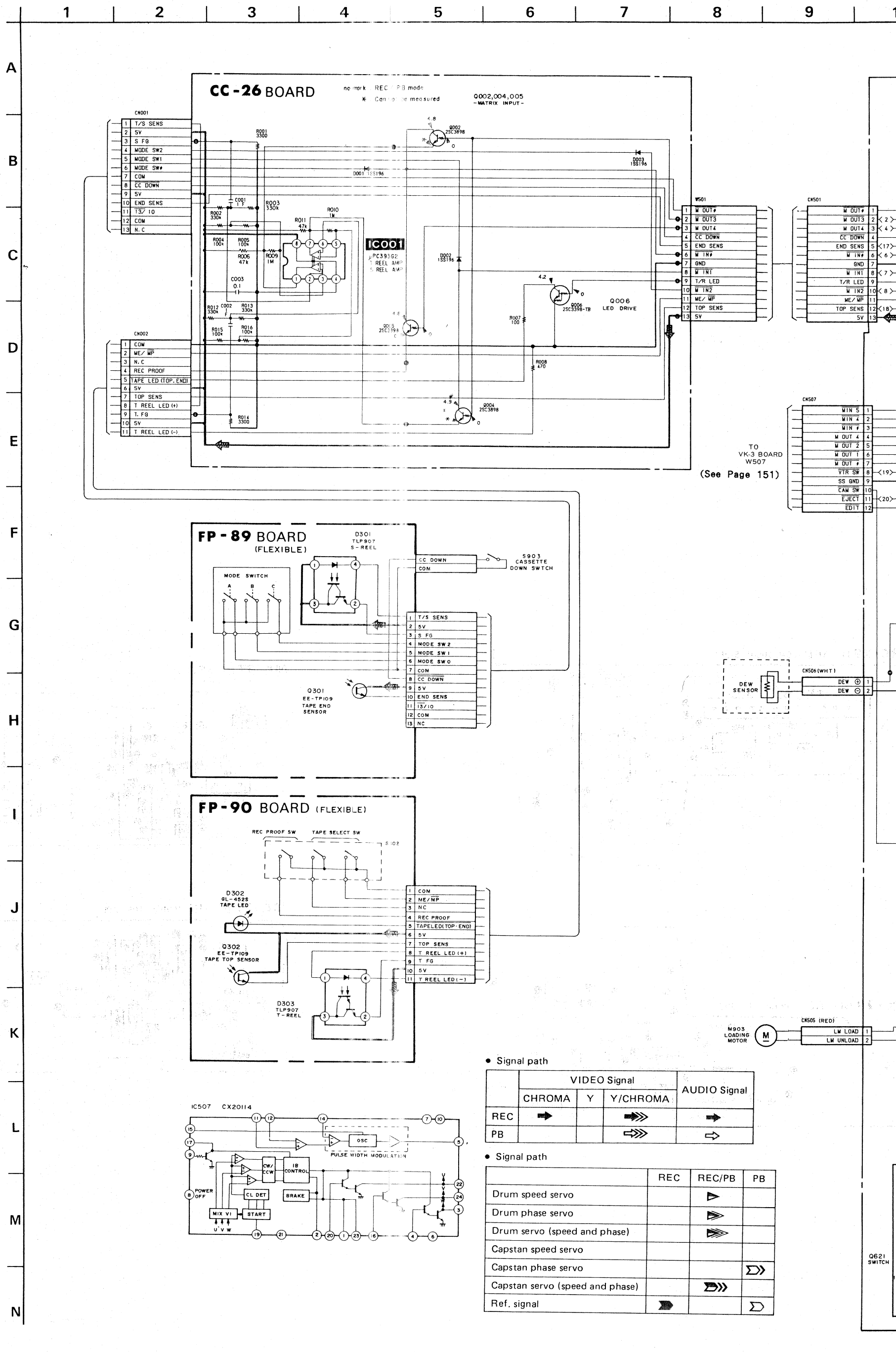
CC-26 BOARD (COMPONENT SIDE)

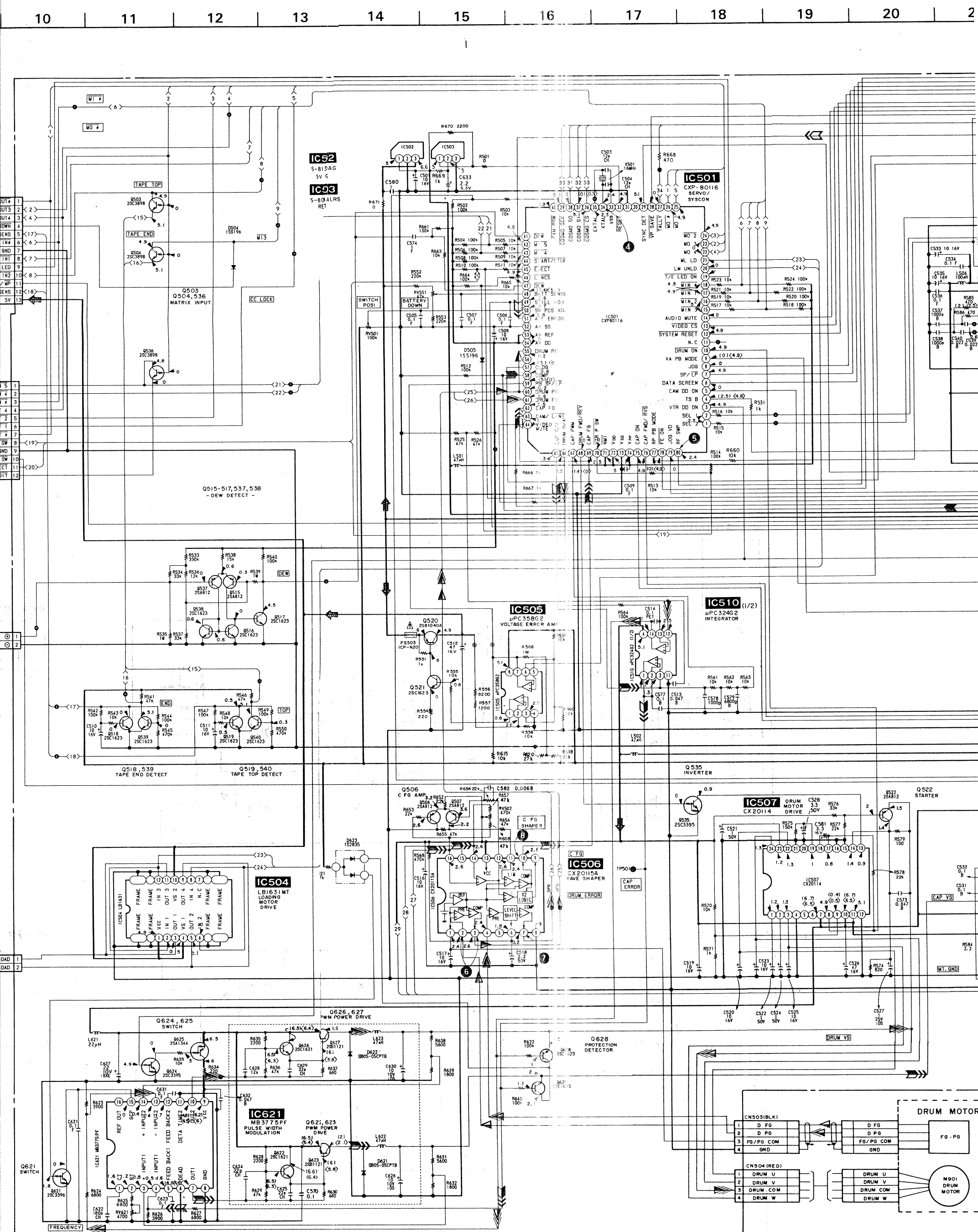


CC-26 BOARD (CONDUCTOR SIDE)

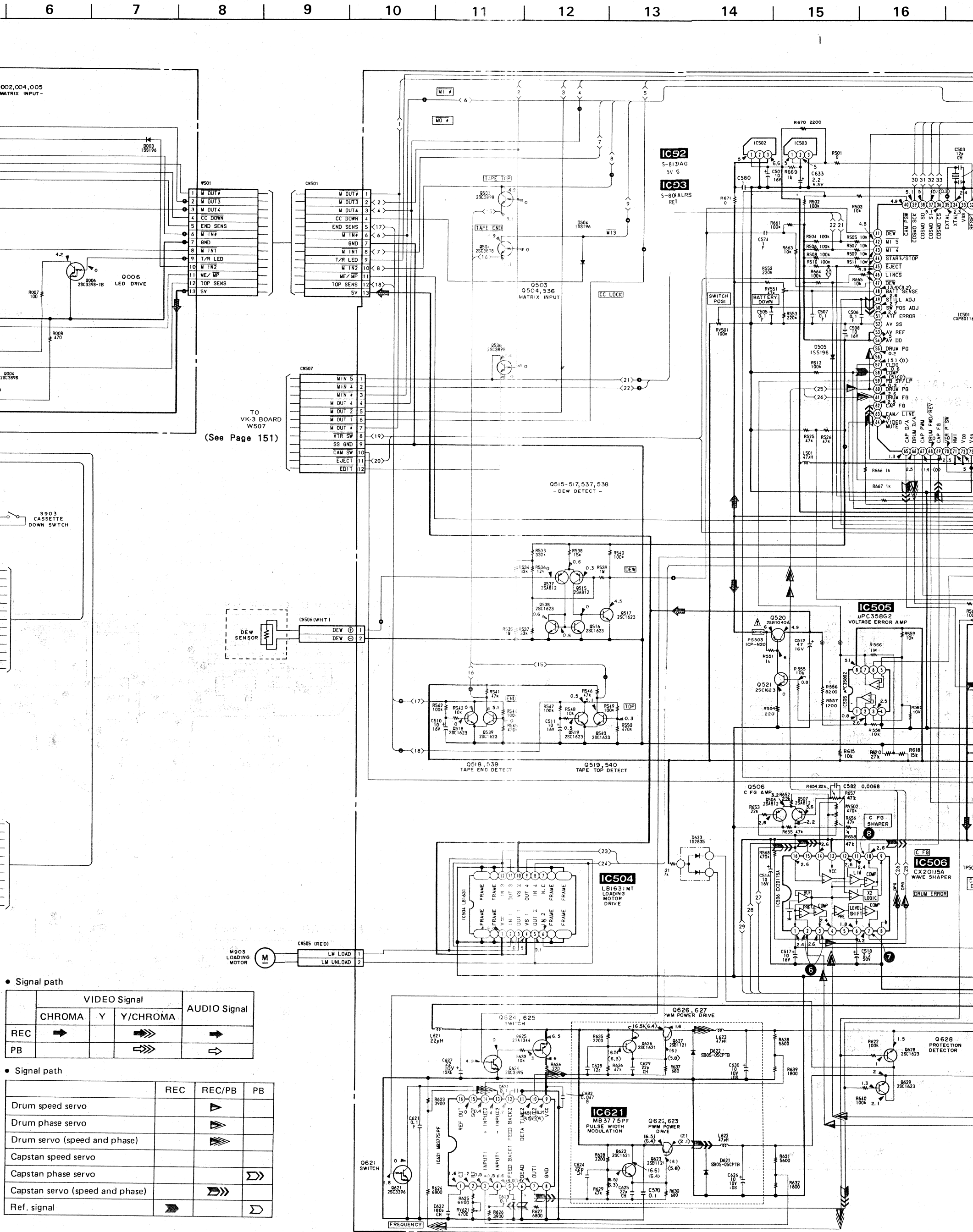


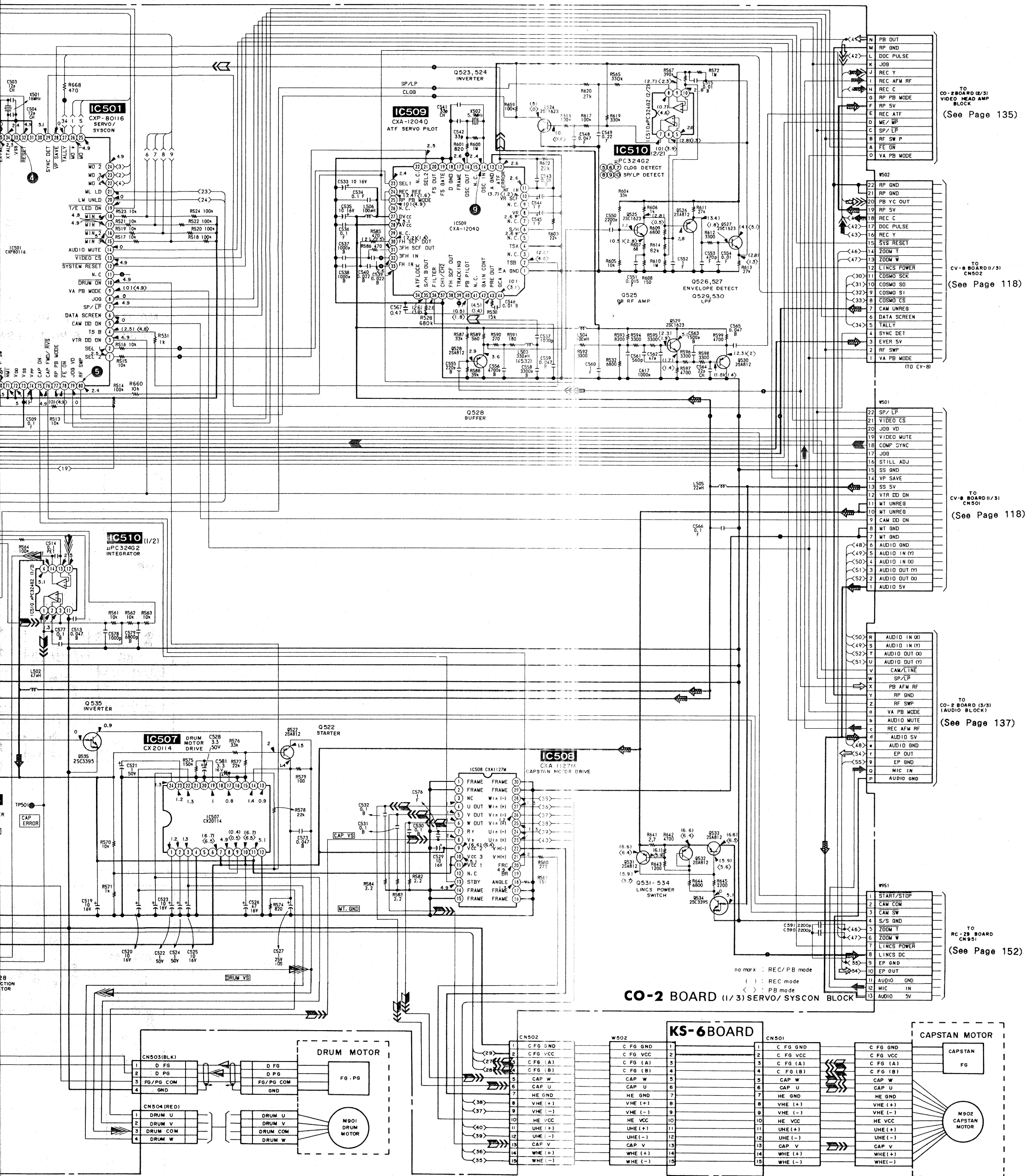
— Ref. No. CO-2, FP-89 BOARDS: 6000 series, CC-26 BOARD: 7000 series, FP-90 KS-6 BOARDS: 8000 series —



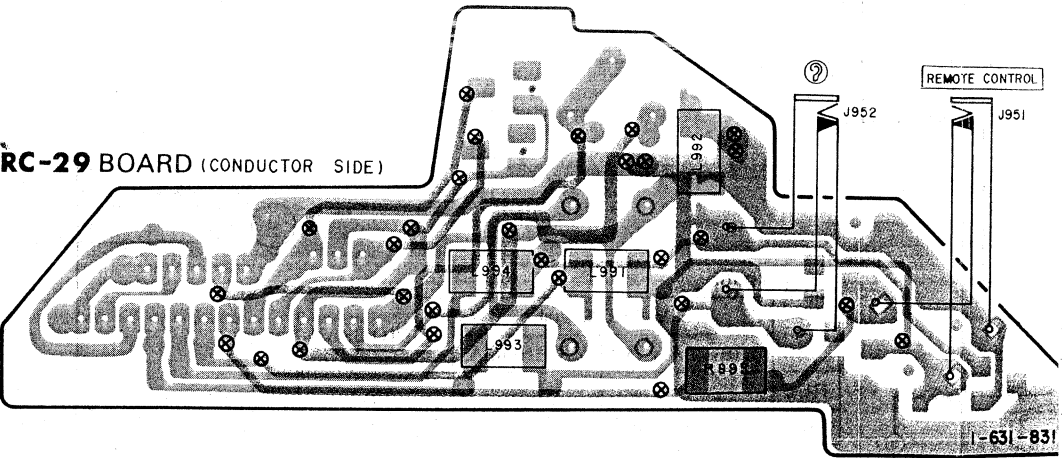
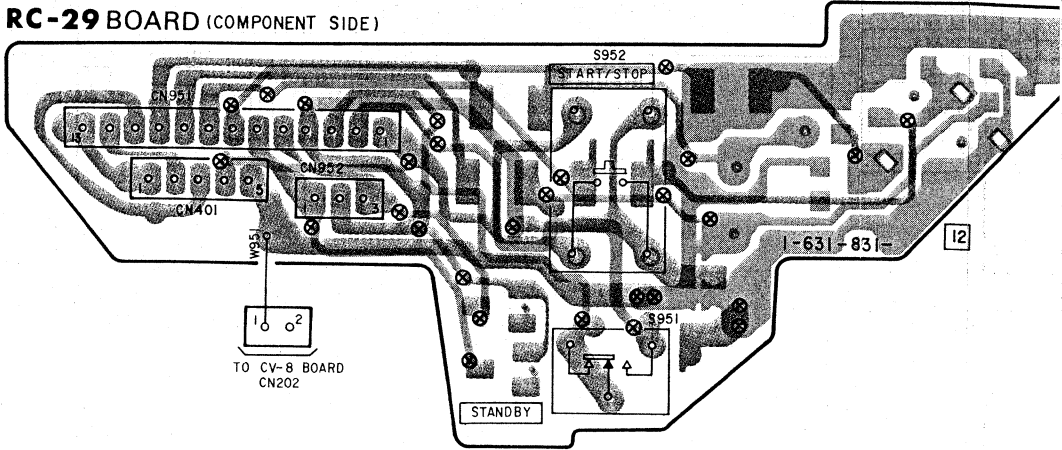
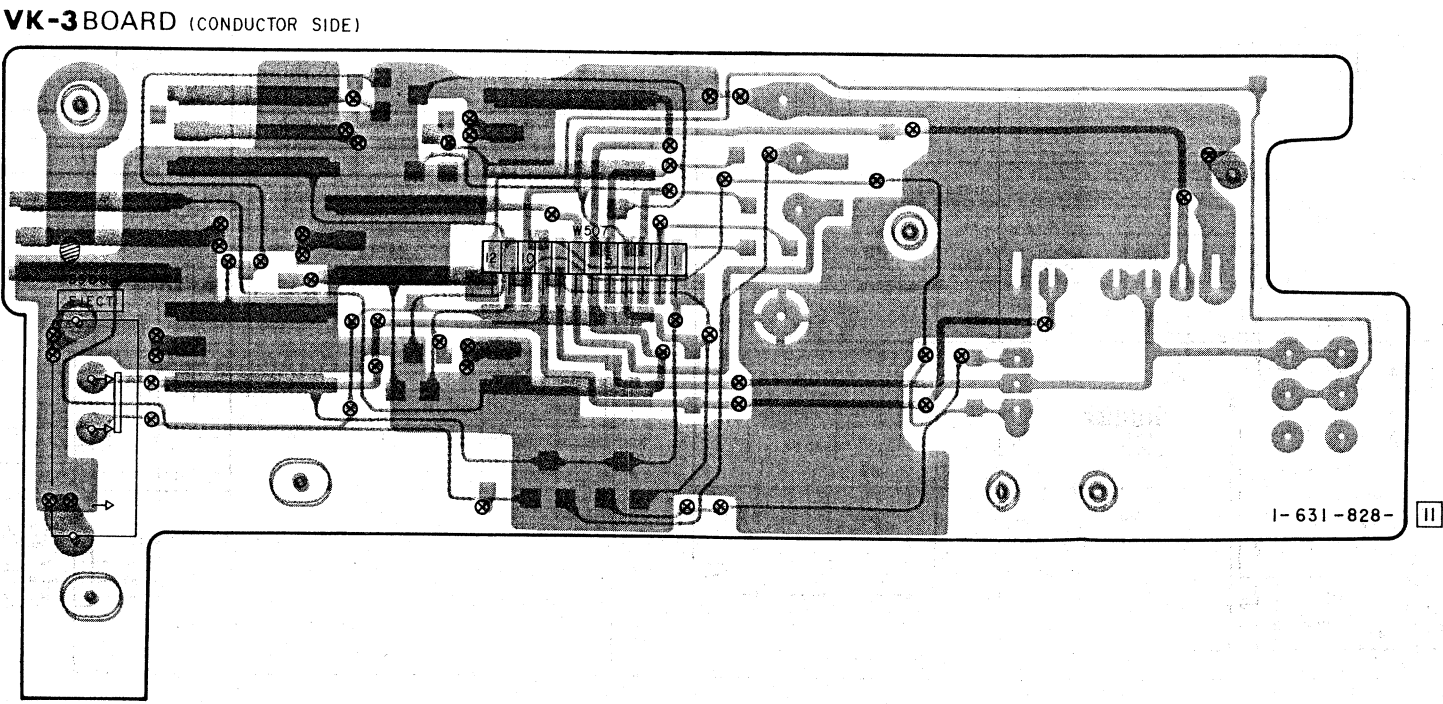
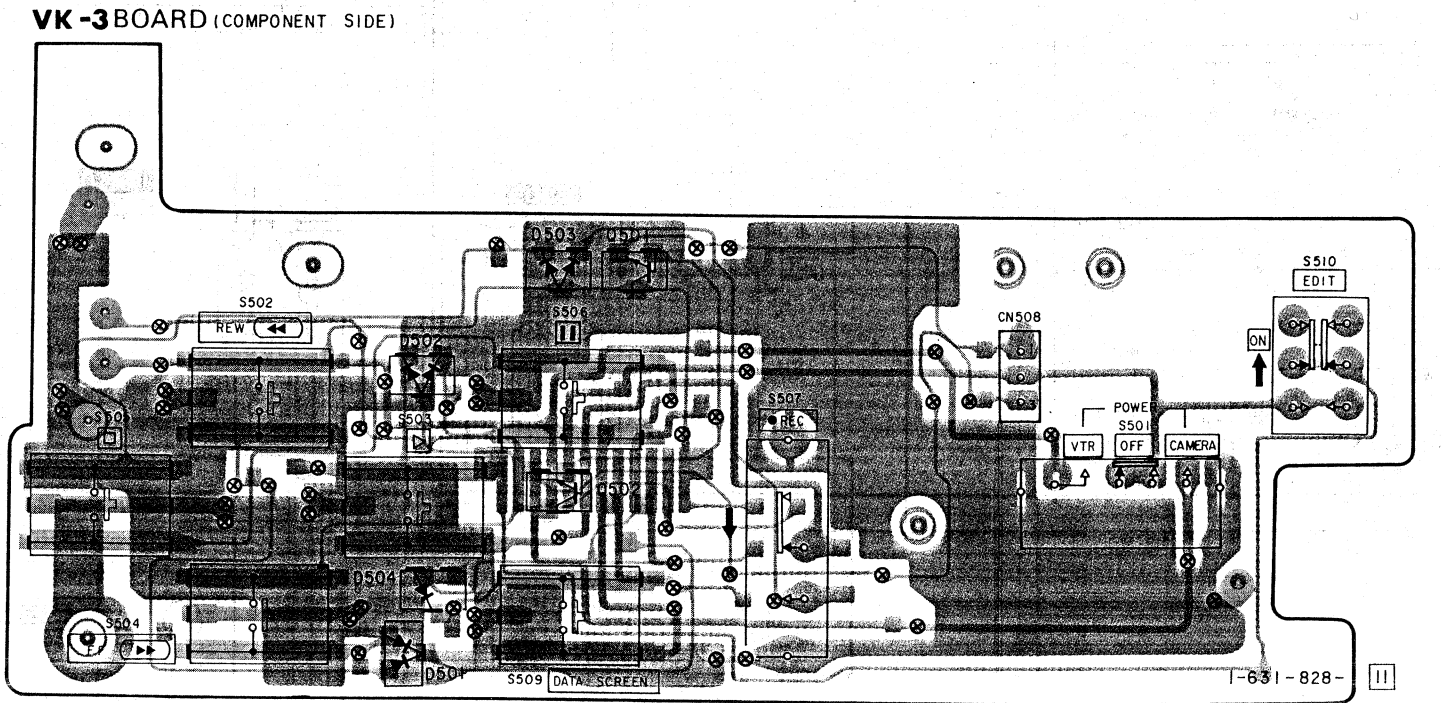


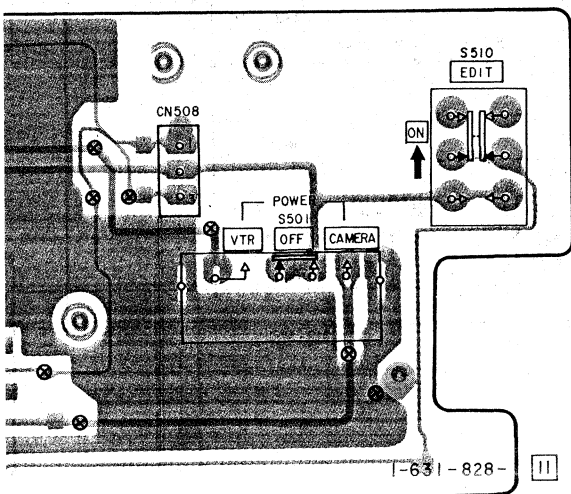
8000 series —



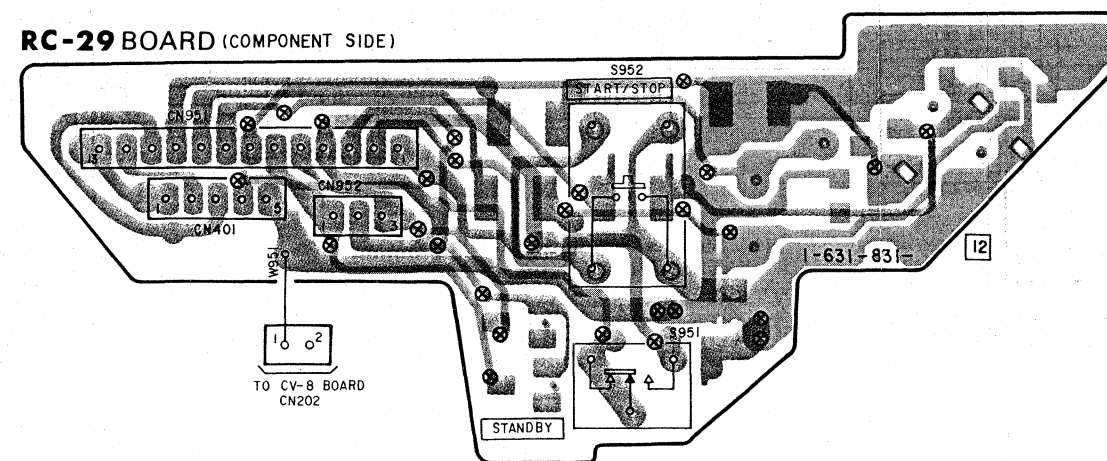


**MA-37 (MIC AMP), RC-29 (START/STOP SWITCH),
VK-3 (VIDEO FUNCTION SWITCH) PRINTED WIRING BOARDS**
— Ref. No. MA-37, VK-3 BOARDS: 9000 series, RC-29, BOARD: 10000 series —

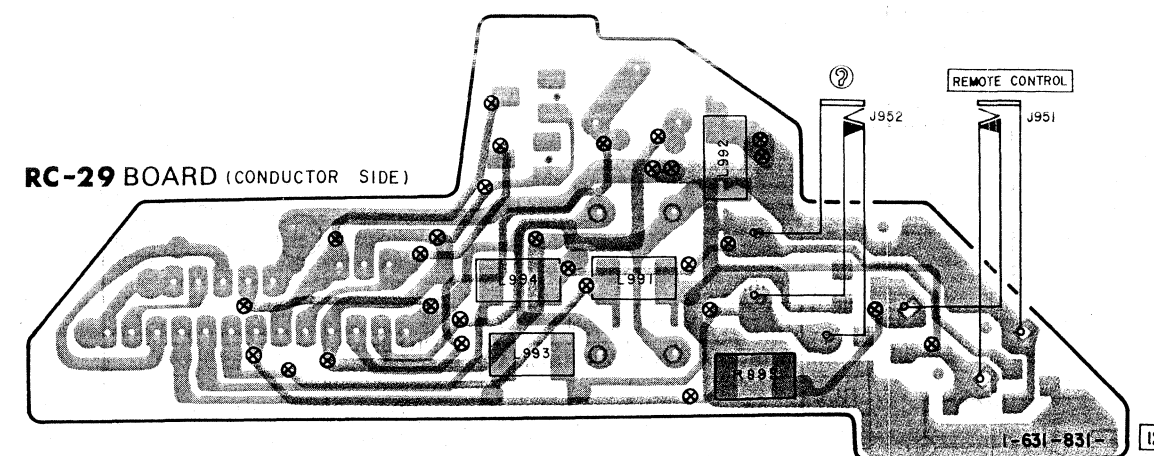




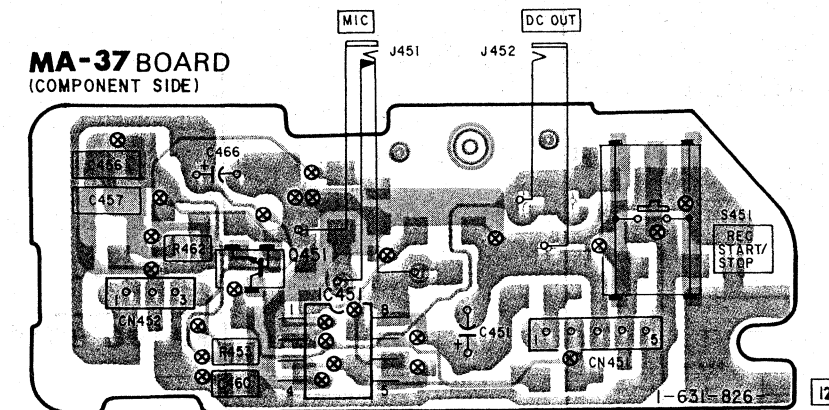
RC-29 BOARD (COMPONENT SIDE)



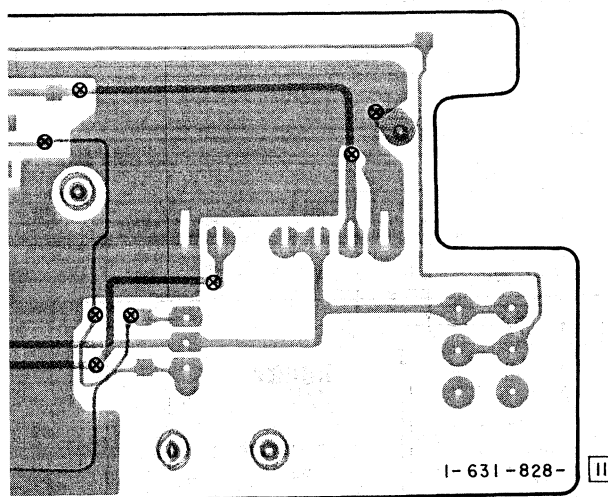
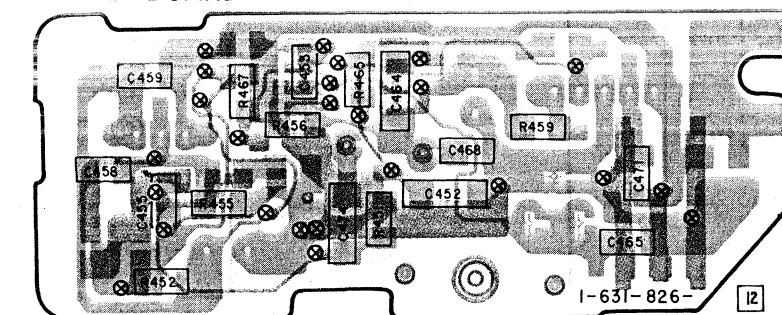
RC-29 BOARD (CONDUCTOR SIDE)



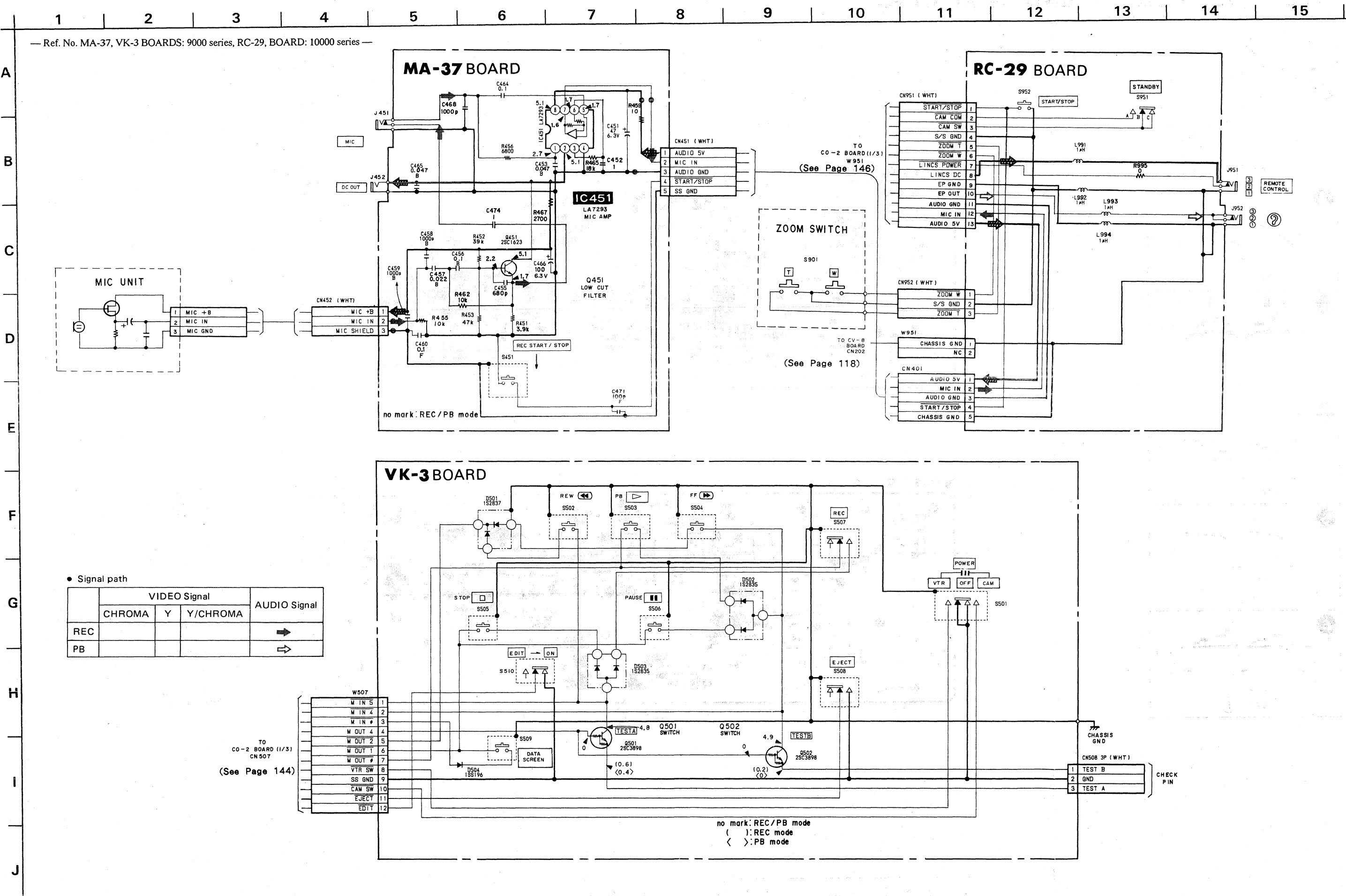
MA-37 BOARD (COMPONENT SIDE)



MA-37 BOARD (CONDUCTOR SIDE)

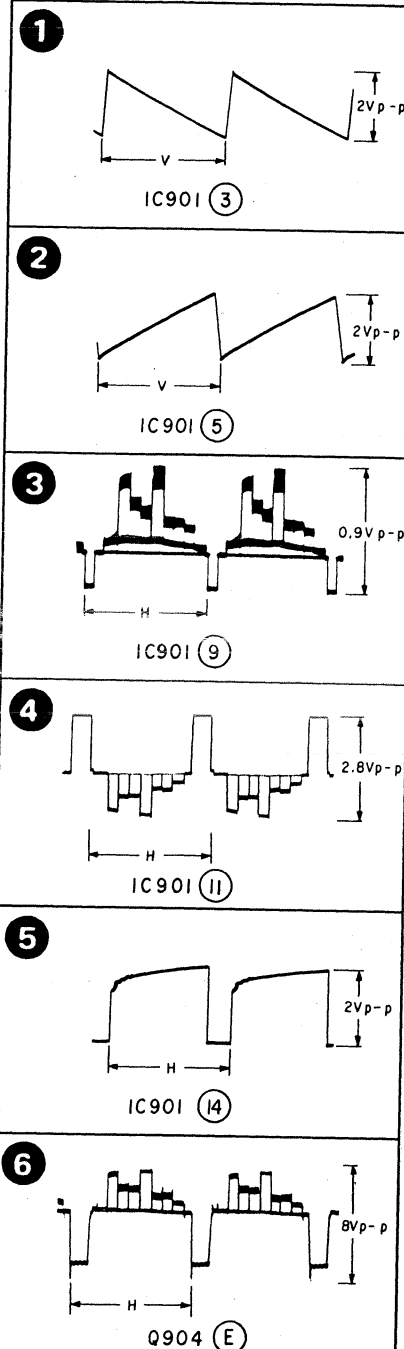


MA-37 (MIC AMP), RC-29 (START/STOP SWITCH), VK-3 (VIDEO FUNCTION SWITCH) SCHEMATIC DIAGRAMS



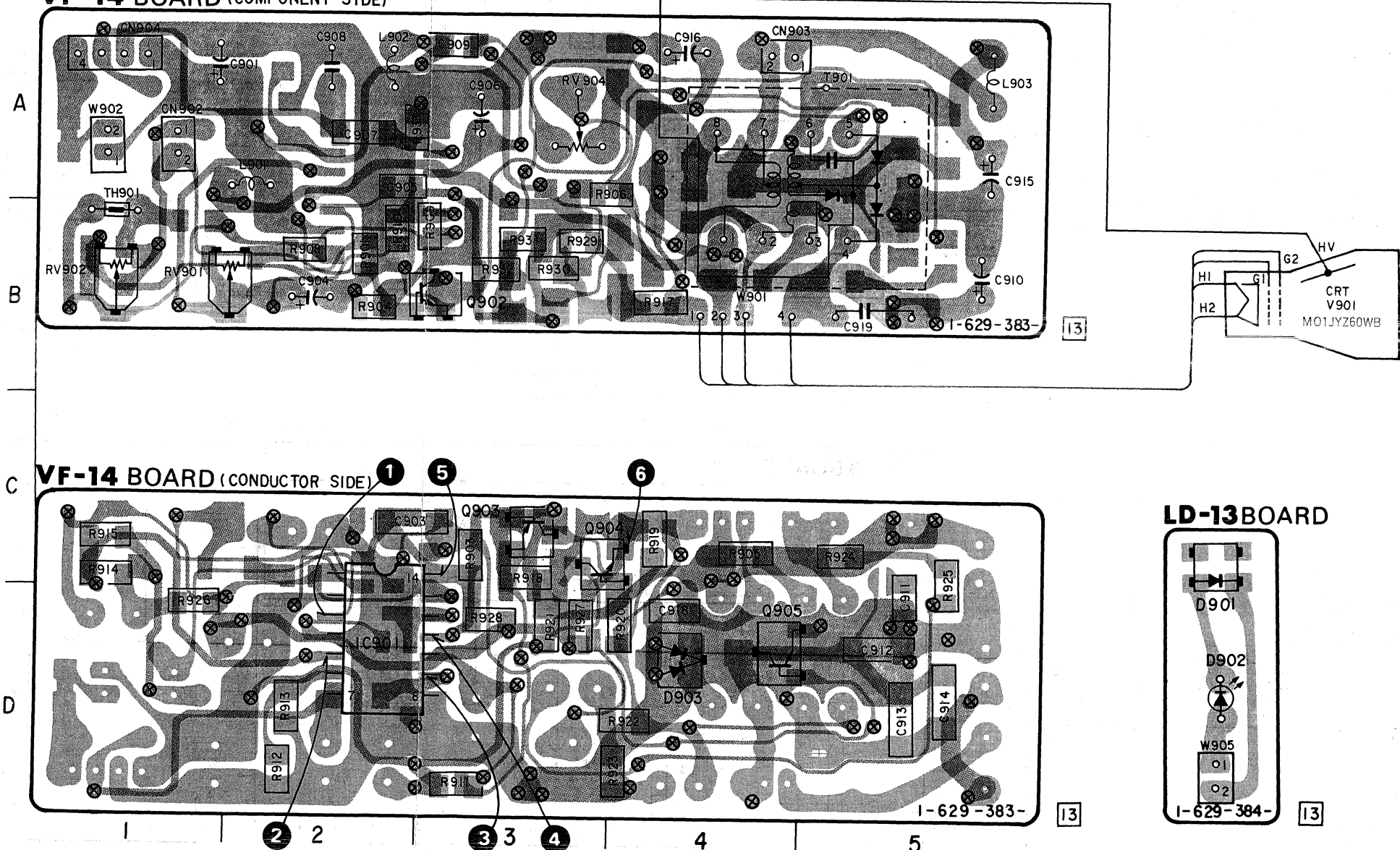
— Ref. No. VF-14 BOARD: 7000 series, LD-13 BOARD: 8000 series —

VF-14 BOARD

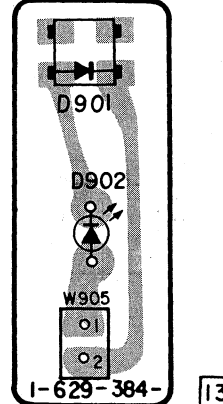


VF-14	BOARD
D903	D-4
IC901	D-2
Q902	B-3
Q903	C-3
Q904	C-3
Q905	D-4

VF-14 BOARD (COMPONENT SIDE)

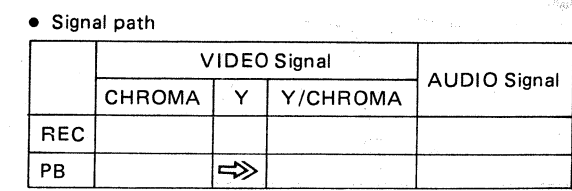


LD-13 BOARD



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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A	
B	
C	
D	
E	
F	
G	
H	
I	
J	



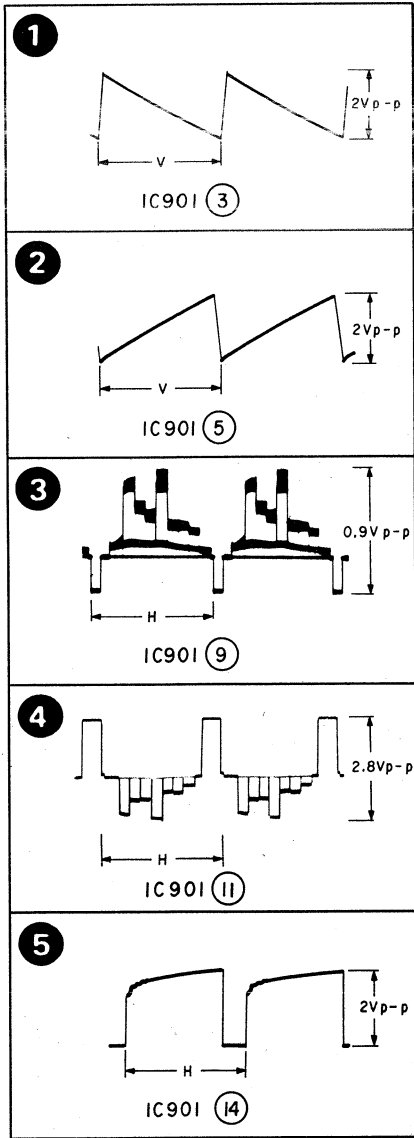
VF-22 (ELECTRONIC VIEW FIDER), LD-17 (TALLY LED) PRINTED WIRING BOARDS

— Ref. No. VF-22 BOARD: 4000 series, LD-17 BOARD: 5000 series —

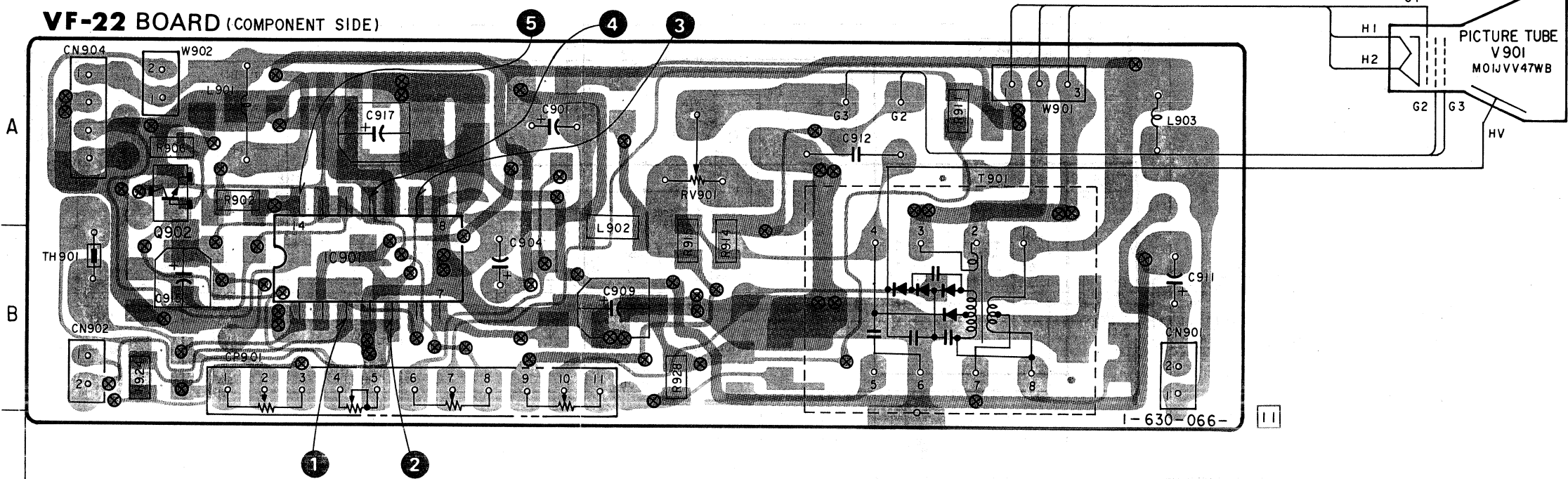
VF-22 BOARD

D903	D-6
IC901	B-2
Q902	A-1
Q903	E-2
Q904	E-6

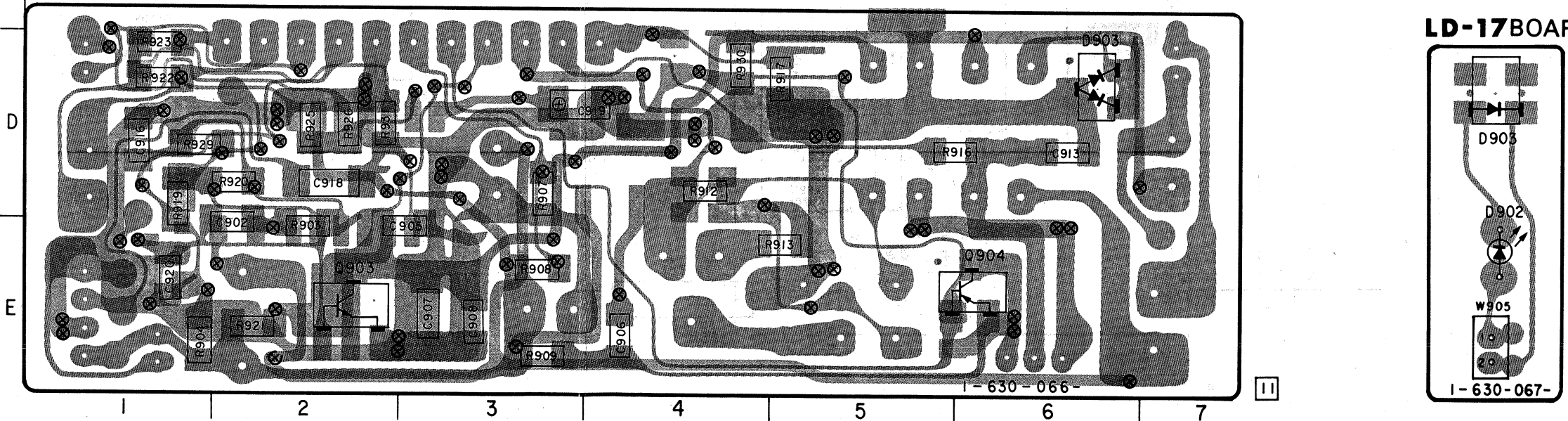
VF-22 BOARD



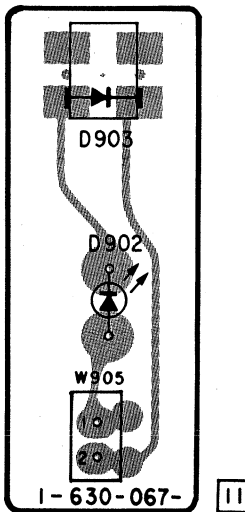
VF-22 BOARD (COMPONENT SIDE)



VF-22 BOARD (CONDUCTOR SIDE)

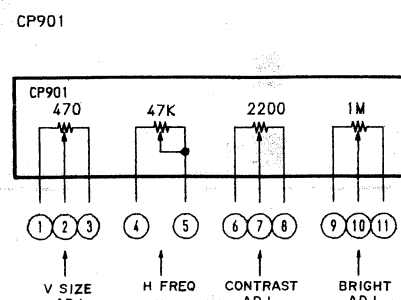


LD-17 BOARD



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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A
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B
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C
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D
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E
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F
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G
—
H
—
I
—
J



	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		➡➡		

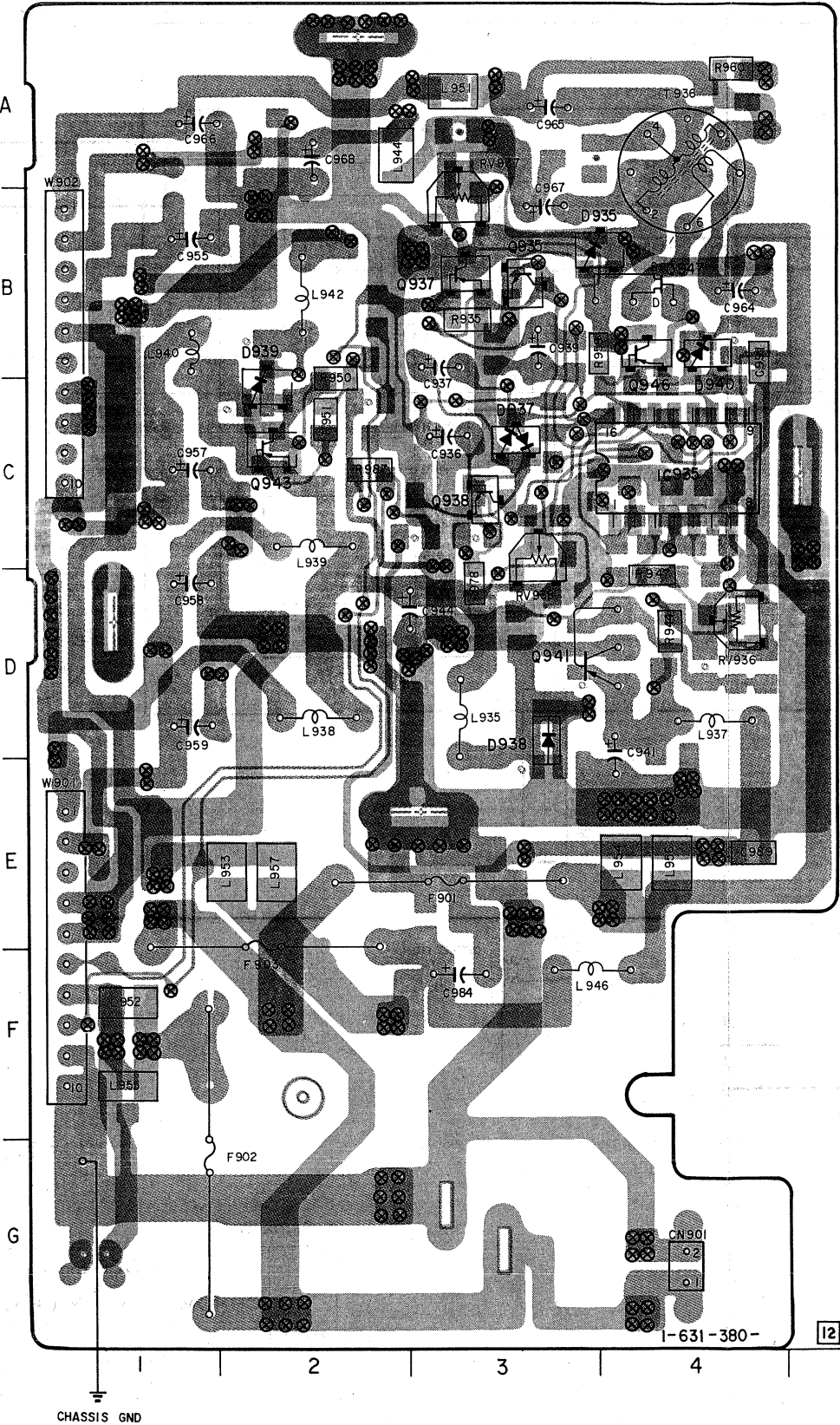
PS-225 (POWER SUPPLY) PRINTED WIRING BOARDS

— Ref. No. PS-225 BOARD: 1000 series —

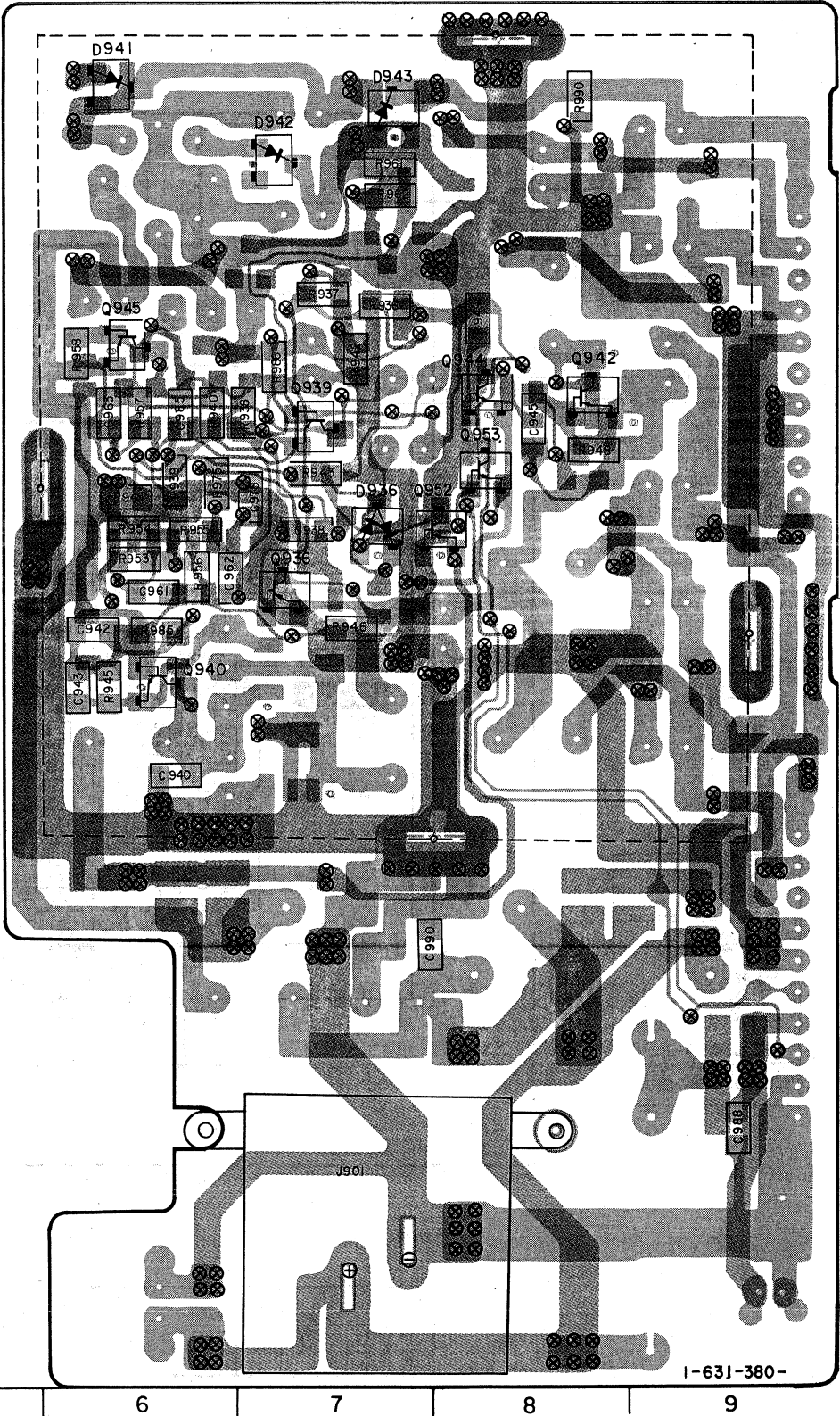
PS-225 BOARD

- | | |
|-------|-----|
| D935 | B-4 |
| D936 | C-7 |
| D937 | C-3 |
| D938 | D-3 |
| D939 | C-2 |
| D940 | C-4 |
| D941 | A-6 |
| D942 | A-7 |
| D943 | A-7 |
| IC935 | C-4 |
| Q935 | B-3 |
| Q936 | C-7 |
| Q937 | B-3 |
| Q938 | C-3 |
| Q939 | C-7 |
| Q940 | D-6 |
| Q941 | D-4 |
| Q942 | C-8 |
| Q943 | C-2 |
| Q944 | B-8 |
| Q945 | C-6 |
| Q946 | C-4 |
| Q947 | B-4 |
| Q952 | C-8 |
| Q953 | C-8 |

PS-225 BOARD (COMPONENT SIDE)



PS-225 BOARD (CONDUCTOR SIDE)



PS-225 (POWER SUPPLY) SCHEMATIC DIAGRAMS

— Ref. No. PS-225 BOARD: 1000 series —

A

B

C

D

E

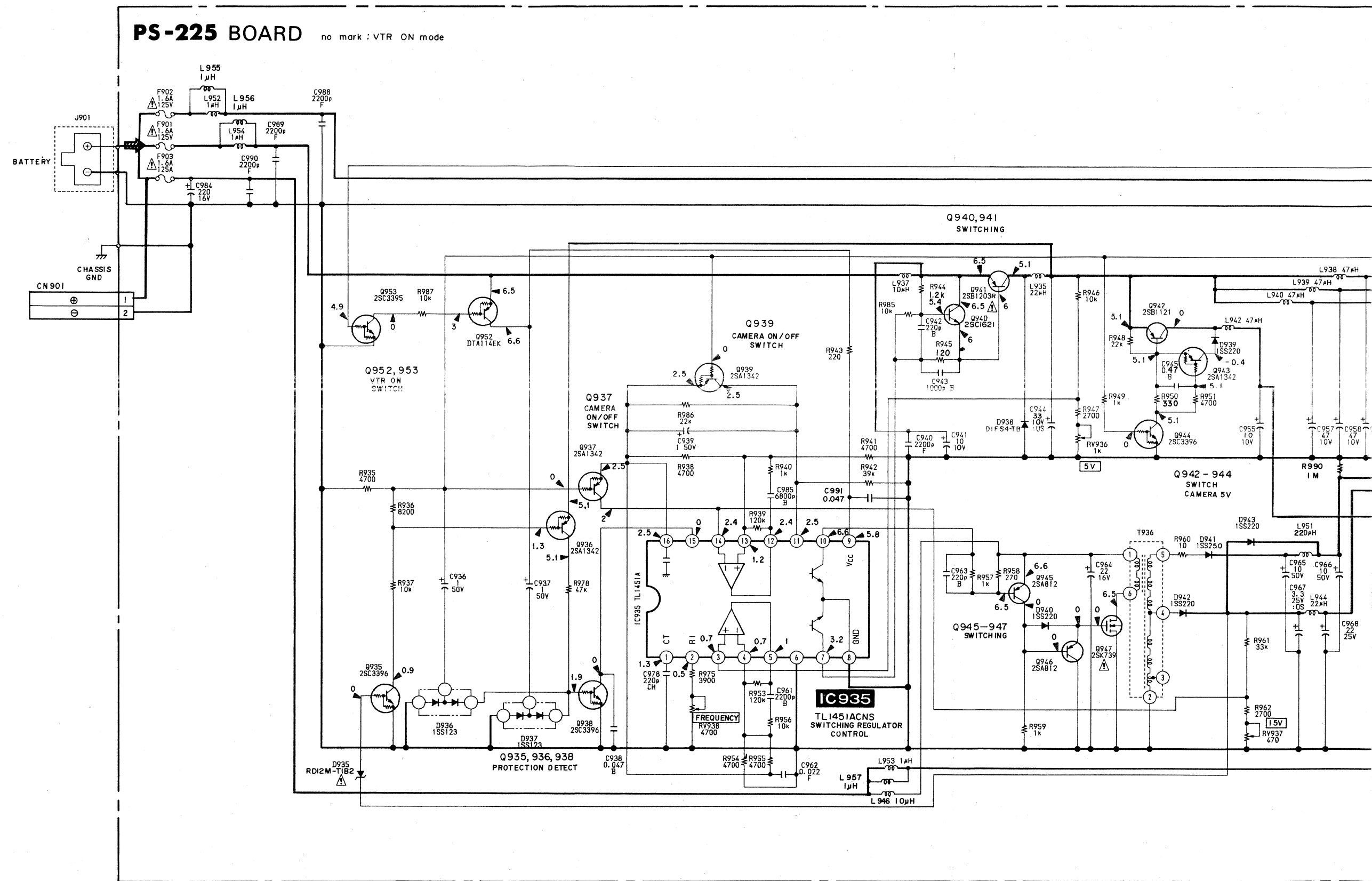
F

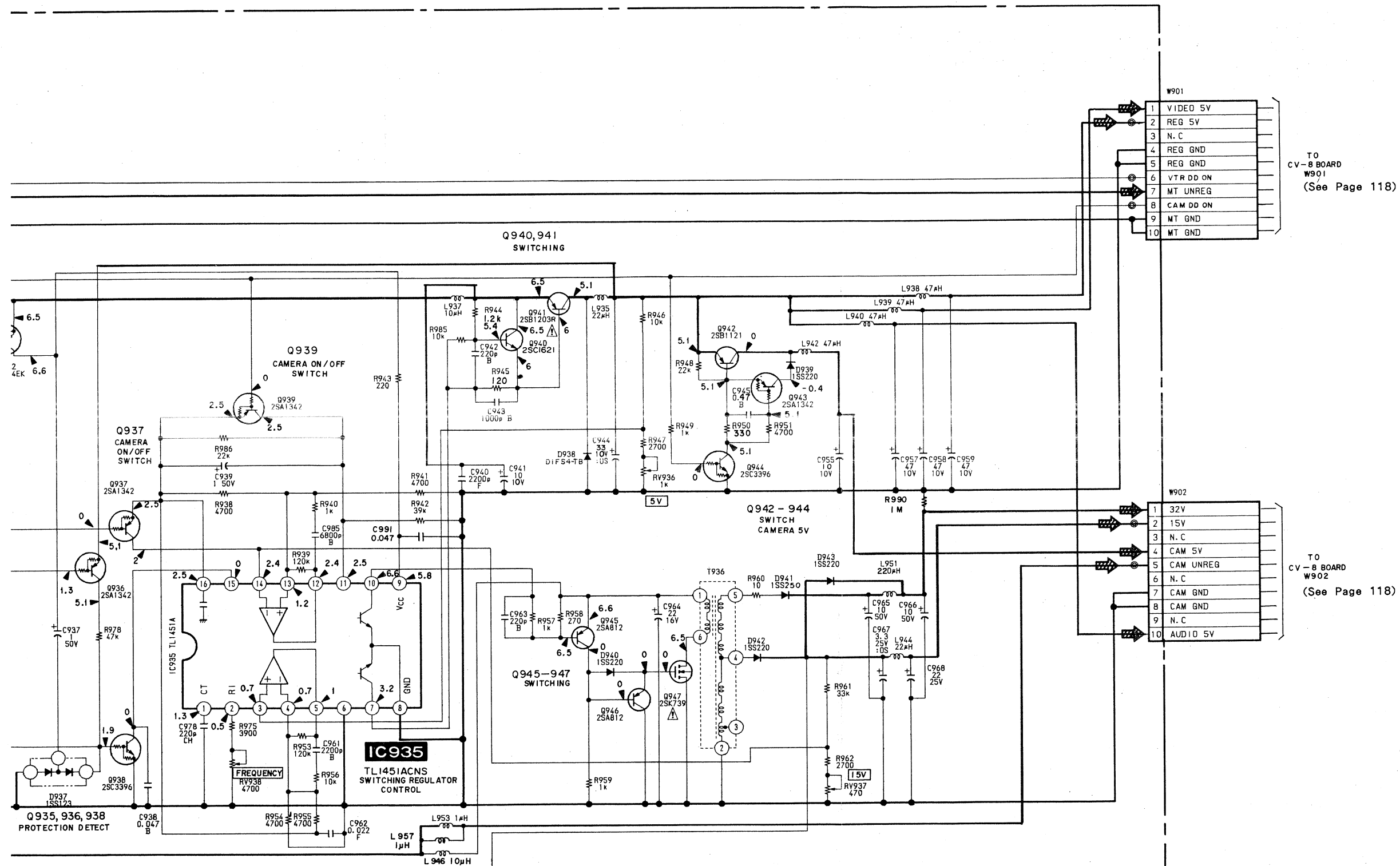
G

H

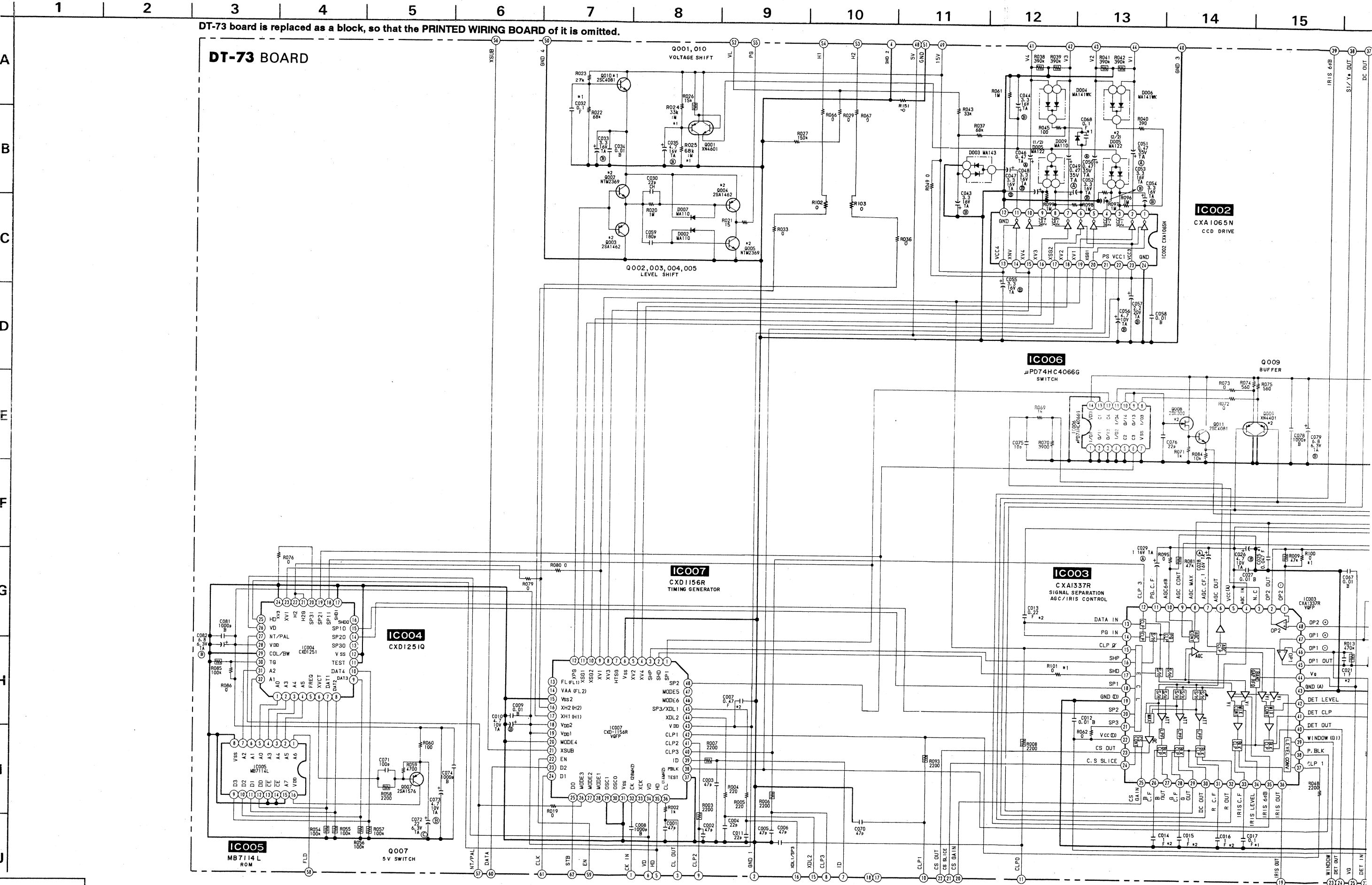
I

J



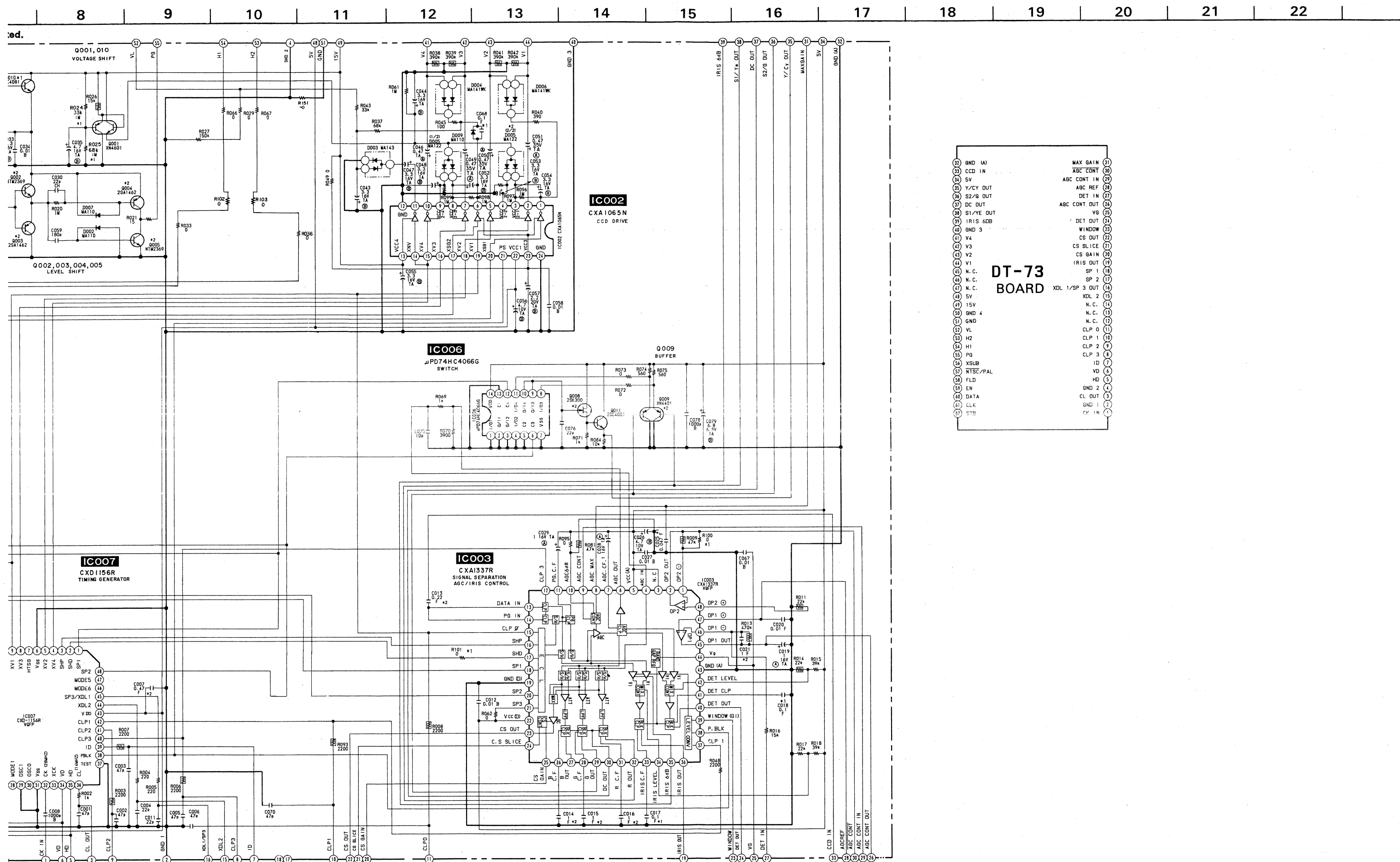


DT-73 (CCD DRIVE, TIMING GENERATOR) SCHEMATIC DIAGRAMS

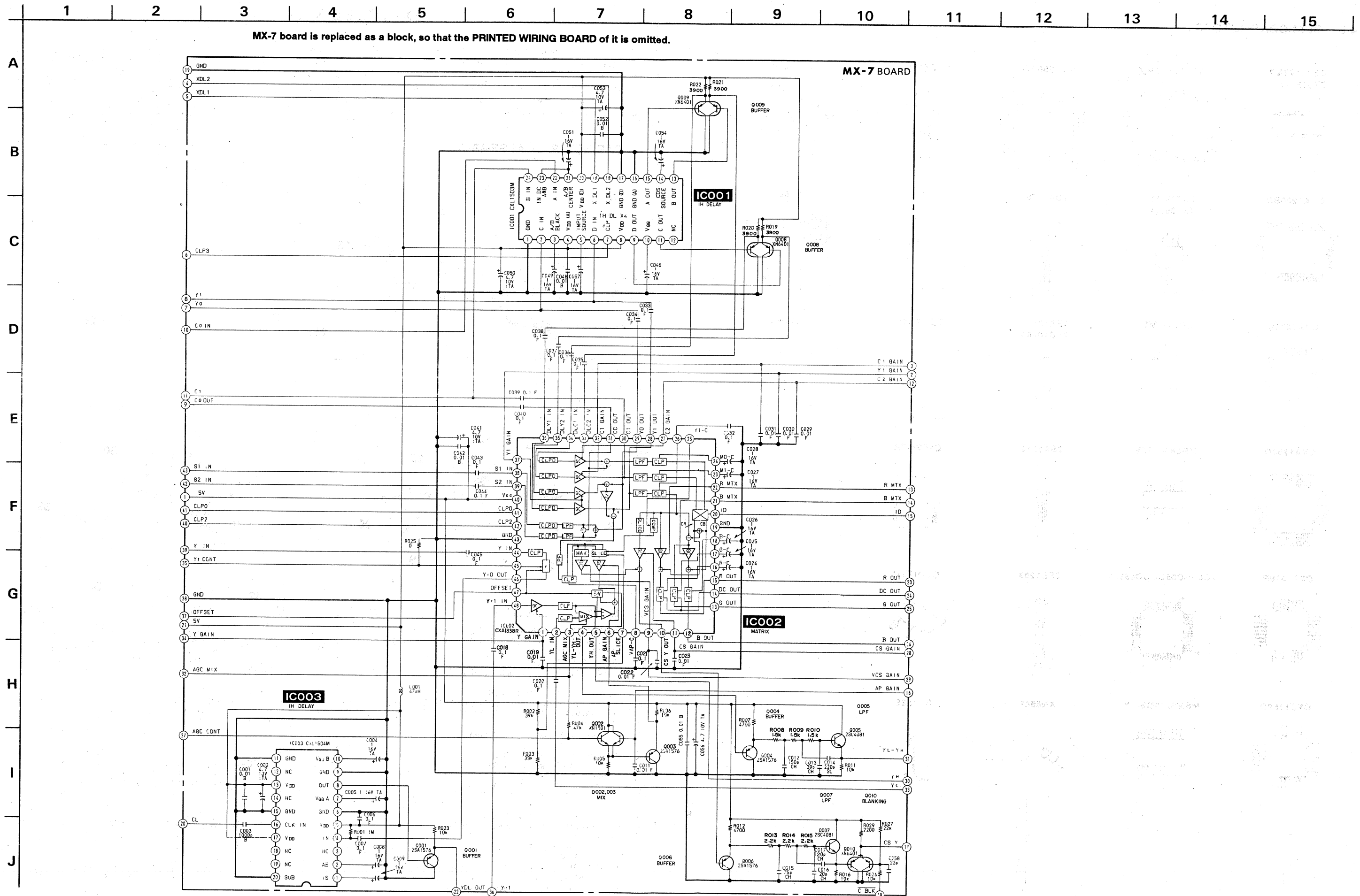


CAMERA

CAMERA



MX-7 (CAMERA SIGNAL MATRIX) SCHEMATIC DIAGRAMS



4-3. SEMICONDUCTORS

SECTION 5
EXPLODED VIEWS

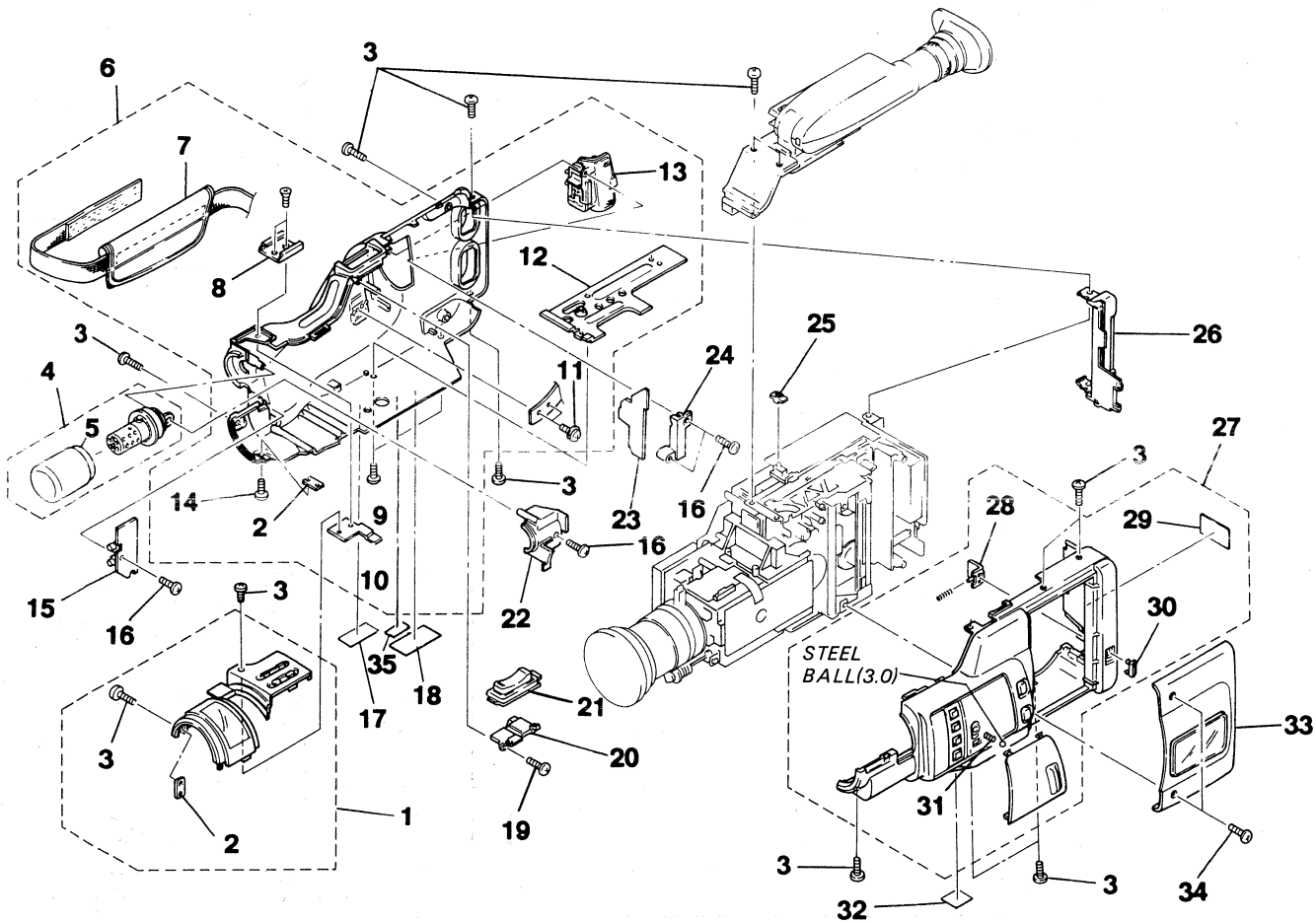
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

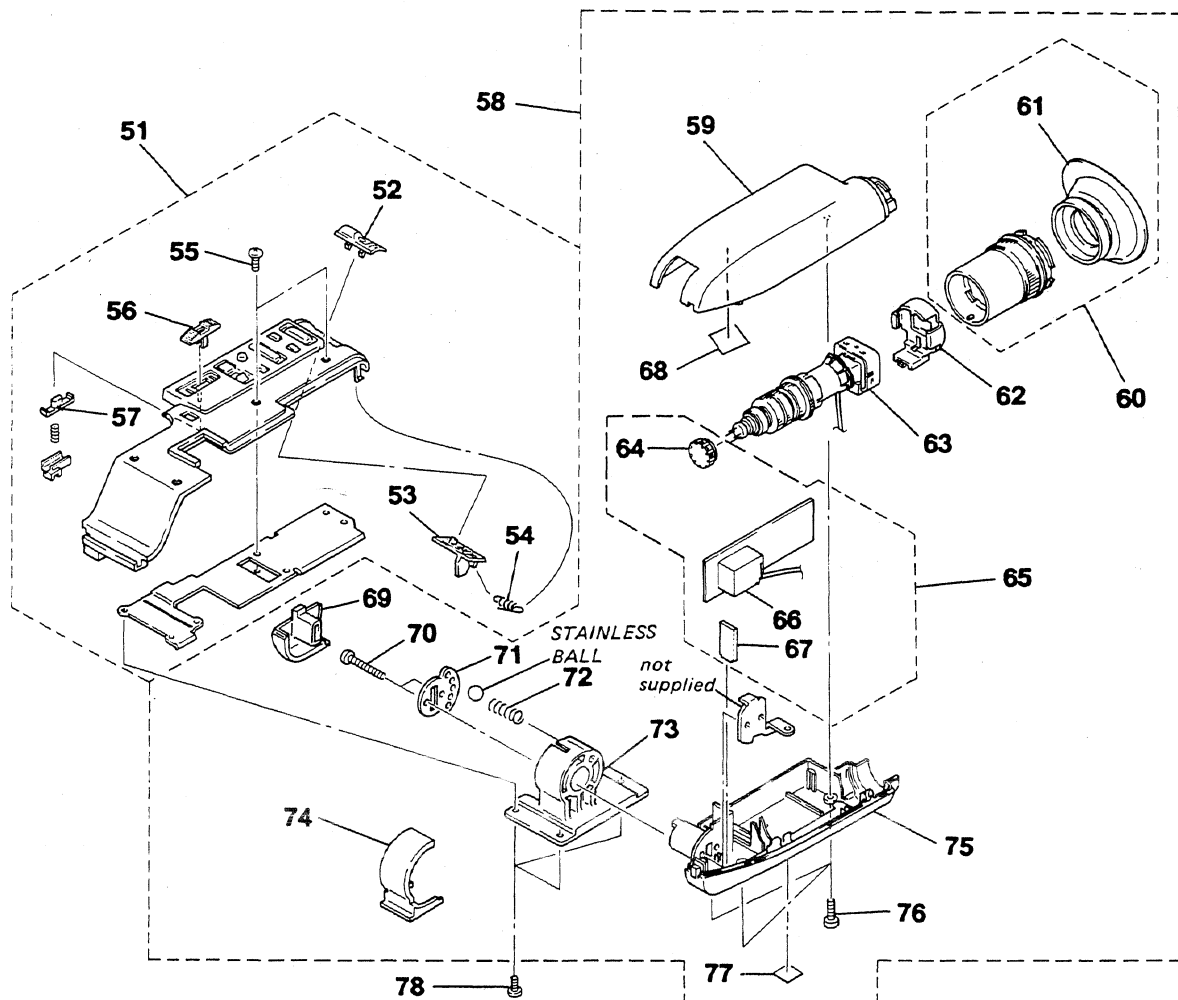
5-1. CABINET (R, L) ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	X-3733-924-1	CABINET (FRONT) ASSY (CCD-F45/F360)	1-3	19	3-713-790-01	SCREW (M2X6), TAPPING, P3	
2	X-3733-946-1	CABINET (FRONT) ASSY (CCD-F46)	1-3	20	*3-732-937-01	RETAINER, ZOOM BUTTON	
3	3-732-912-01	JOINT, L/R		21	1-571-837-11	SWITCH, PUSH (ZOOM SW) (S901)	
4	3-719-381-01	SCREW (M2X4)		22	3-737-737-01	HOUSING, MICROPHONE	
	1-542-125-21	MICROPHONE (C-2027)	5	23	*1-631-831-11	RC-29 BOARD	
5	3-707-650-11	SCREEN, WIND		24	*3-732-928-01	STOPPER, RC	
6	X-3733-923-1	CABINET (LEFT) ASSY (CCD-F45/F360)	2,7-14	25	3-732-926-01	BUTTON, EDIT	
	X-3733-944-1	CABINET (LEFT) ASSY (CCD-F46)	2,7-14	26	3-732-924-01	BLIND, L/R (CCD-F45/F360)	
7	3-719-323-01	BELT, GRIP			3-732-924-31	BLIND, L/R (CCD-F46)	
8	3-724-511-01	SHOE, ACCESSORY		27	X-3733-926-1	CABINET (RIGHT) ASSY (CCD-F45/F360)	28-31
9	3-719-381-31	SCREW (M2X3)		27	X-3733-949-1	CABINET (RIGHT) ASSY (CCD-F46)	28-31
10	3-737-723-01	RETAINER SHOE		28	3-732-906-01	LOCK, BATTERY	
11	3-669-480-21	+ PTPWH 2		29	*3-719-683-01	LABEL, BATTERY FITTING	
12	*3-732-911-01	SHEET METAL, TRIPOD		30	3-732-905-01	BUTTON, BATTERY RELEASE (CCD-F45/F360)	
13	X-3732-953-1	KNOB ASSY, SP			3-732-905-21	BUTTON, BATTERY RELEASE (CCD-F46)	
14	3-719-831-21	SCREW (M2X4)		31	3-576-098-00	SPRING, COMPRESSION	
15	*A-7061-741-A	MA-37 BOARD, COMPLETE		32	*3-704-256-01	LABEL, CAUTION (US MODEL (CCD-F45/F46))	
16	3-713-790-31	SCREW (M2X8), TAPPING, P3		33	X-3733-927-1	LID ASSY, CASSETTE (CCD-F45)	
17	*3-704-367-01	LABEL (US MODEL (CCD-F45/F46))			X-3733-947-1	LID ASSY, CASSETTE (CCD-F46)	
18	*3-737-746-01	LABEL, MODEL NUMBER (U) (CCD-F45)			X-3733-994-1	LID ASSY, CASSETTE (CCD-F360)	
	*3-737-791-01	LABEL, MODEL NUMBER (U) (CCD-F46)		34	3-733-912-01	SCREW (M2X2.5), SPECIAL HEAD	
	*3-741-513-01	LABEL, MODEL NUMBER (E) (CCD-F360)		35	3-703-845-01	LABEL (N)(U/C), MAIN CAUTION (CCD-F45/F46)	
	*3-746-817-01	LABEL, MODEL NUMBER (E)					

(CCD-F360 Venezuelan Model) — 172 —

5-2. CABINET (UPPER), EVF ASSEMBLY (TYPE A)

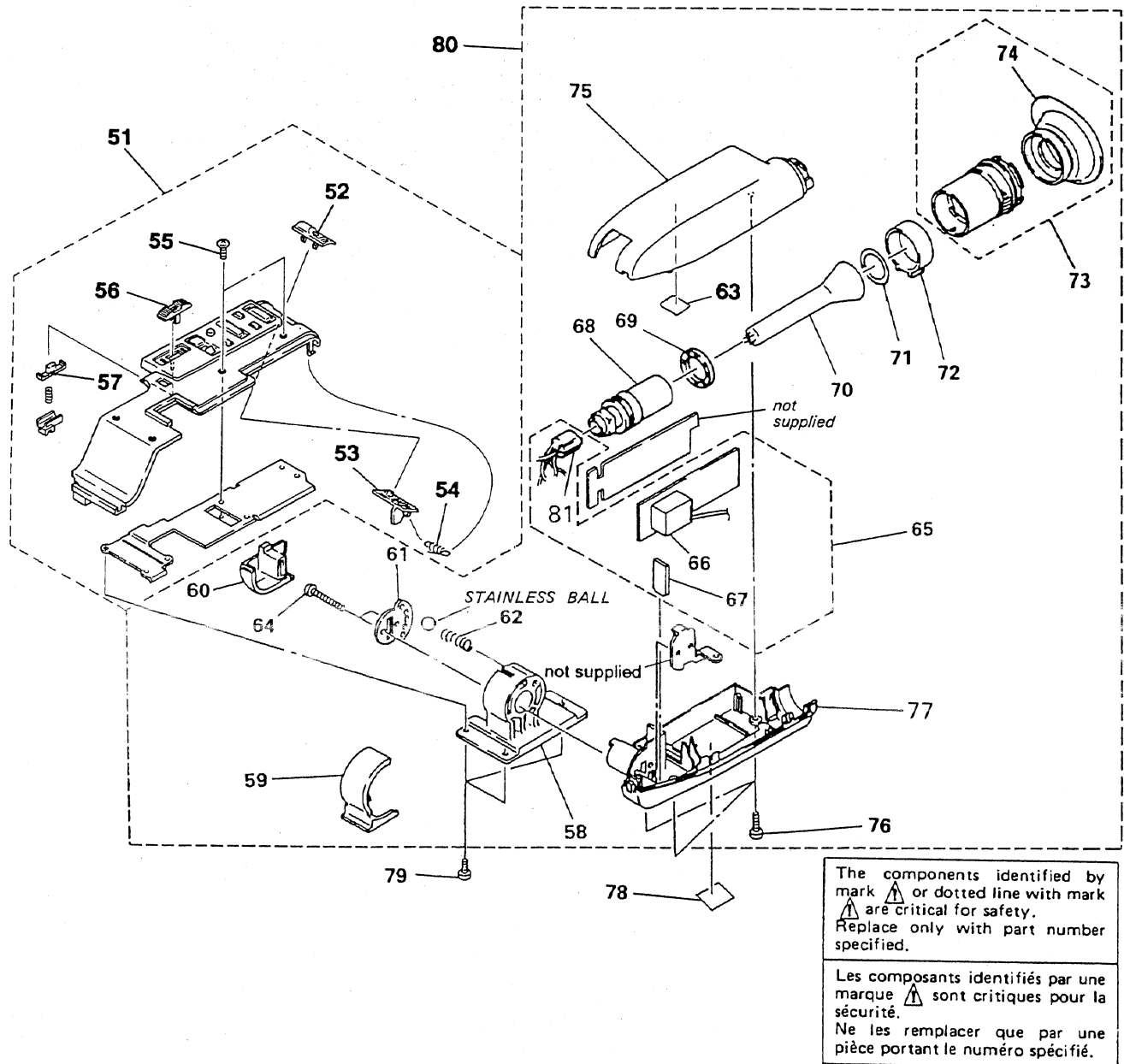


The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	X-3733-925-1	CABINET (UPPER) ASSY (CCD-F45/F360)	52-57	65	*A-7061-560-A	VF-14 BOARD, COMPLETE	64, 66, 67
52	X-3733-945-1	CABINET (UPPER) ASSY (CCD-F46)	52-57	66	 1-439-431-11	TRANSFORMER ASSY, FRYBACK (T901)	
53	3-732-919-01	BUTTON, EJECT (CCD-F45/F360)		67	*1-629-384-11	LD-13 BOARD	
54	*3-732-919-11	BUTTON, EJECT (CCD-F46)		68	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE	
55	3-732-920-01	LOCK, EJECT		69	3-732-949-01	BLIND, EVF CABINET (LOWER)	
56	3-669-440-00	SPRING, TENSION		70	3-732-987-01	SCREW (M2X20), +P	
57	3-719-381-01	SCREW (M2X4)		71	3-732-947-01	PLATE, LOCK	
58	3-718-226-01	BUTTON, POWER		72	3-732-946-01	SPRING, COMPRESSION	
59	*3-718-257-11	BUTTON, PUSH, POWER		73	*3-732-944-01	BEARING, EVF	
60	A-7019-142-A	EVF COMPLETE ASSY	59-77	74	3-732-950-01	BLIND, EVF	
61	3-732-948-01	CABINET (UPPER), EVF		75	X-3732-911-1	CABINET (LOWER) ASSY, EVF	
62	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	61	76	3-713-790-31	SCREW (M2X8), TAPPING, P3	
63	3-733-922-01	EYE CUP		77	*3-703-848-01	LABEL (N), SUB CAUTION	
64	X-3732-910-1	HOLDER ASSY, CRT		78	3-732-988-01	SCREW (M2X2.5)	
	 1-452-482-11	CRT ASSY (M91JYZ60WB) (VF-14 BOARD)					
	 1-540-019-21	SOCKET ASSY, CRT (W901)					

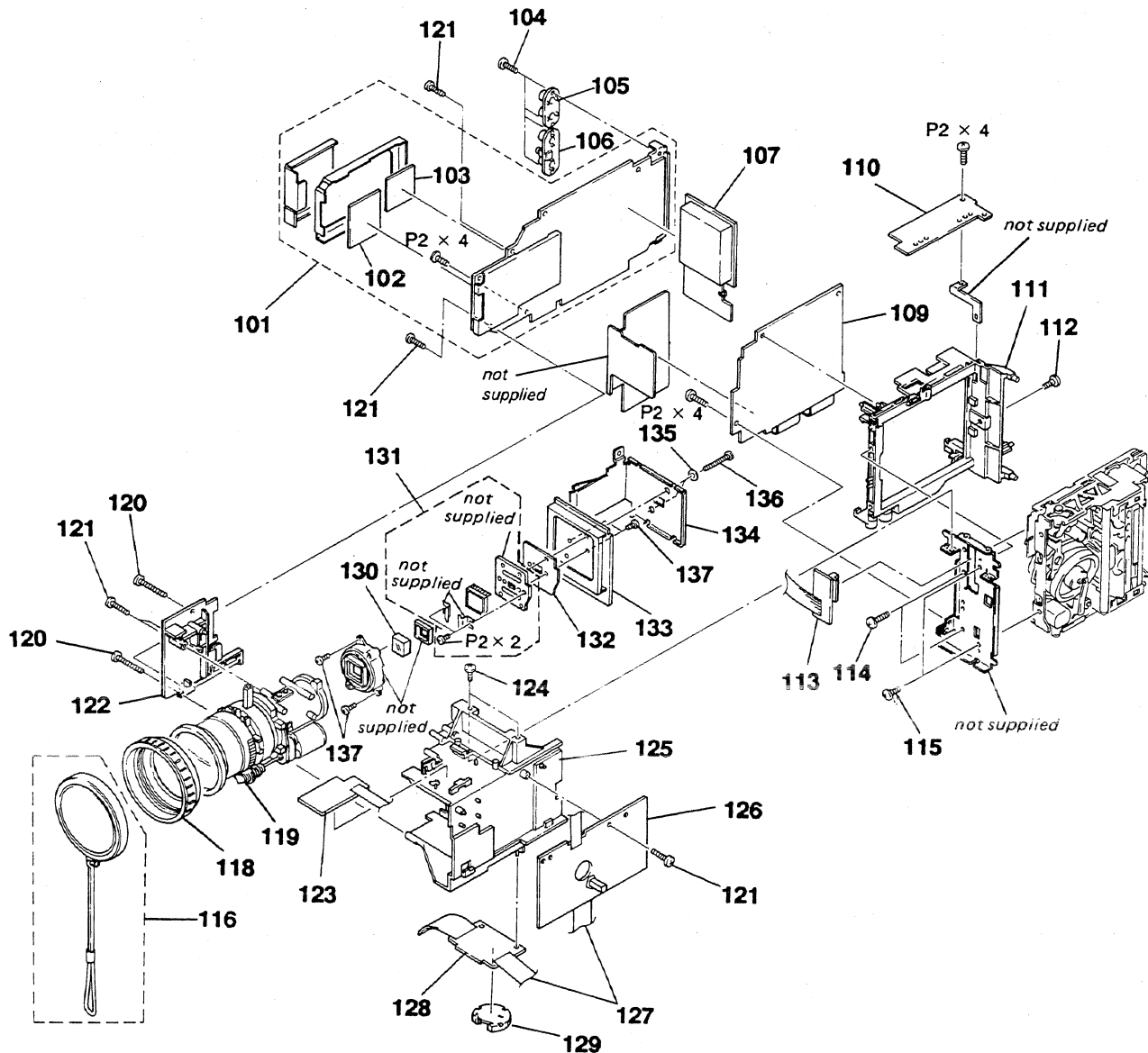
5-3. CABINET (UPPER), EVF ASSEMBLY (TYPE B)



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	X-3733-925-1	CABINET (UPPER) ASSY (CCD-F45/F360)	52-57	65	*A-7061-558-A	VF-22 BOARD, COMPLETE	66, 67, 81
52	X-3733-945-1	CABINET (UPPER) ASSY (CCD-F46)	52-57	66	▲1-439-428-11	TRANSFORMER ASSY, FLYBACK (T901)	
	3-732-919-01	BUTTON, EJECT (CCD-F45/F360)		67	*1-630-067-11	LD-17 BOARD	
	*3-732-919-11	BUTTON, EJECT (CCD-F46)		68	▲1-451-310-21	DEFLECTION YOKE (B/W)	
53	3-732-920-01	LOCK, EJECT		69	3-724-549-01	LOCK, CRT	
54	3-669-440-00	SPRING, TENSION					
55	3-719-381-01	SCREW (M2X4)		70	▲1-546-065-11	CATHODE-RAY TUBE, B/W	
56	3-718-226-01	BUTTON, POWER		71	3-724-570-01	RING, CRT FIXED	
57	*3-718-257-11	BUTTON, PUSH, POWER		72	X-3724-509-1	HOLDER ASSY, CRT	
58	*3-732-944-01	BEARING, EVF		73	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	74
59	3-732-950-01	BLIND, EVF		74	3-733-922-01	EYE CUP	
60	3-732-949-01	BLIND, EVF CABINET (LOWER)		75	3-732-948-01	CABINET (UPPER), EVF	
61	3-732-947-01	PLATE, LOCK		76	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	3-732-946-01	SPRING, COMPRESSION		77	X-3732-911-1	CABINET (LOWER) ASSY, EVF	
				78	*3-703-848-01	LABEL (N), SUB CAUTION	
63	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE		79	3-732-988-01	SCREW (M2X2.5)	
64	3-732-987-01	SCREW (M2X20), +P		80	A-7019-142-A	EVF COMPLETE ASSY	58-78, 81
				81	▲1-526-978-21	SOCKET ASSY, CRT (CRT901)	

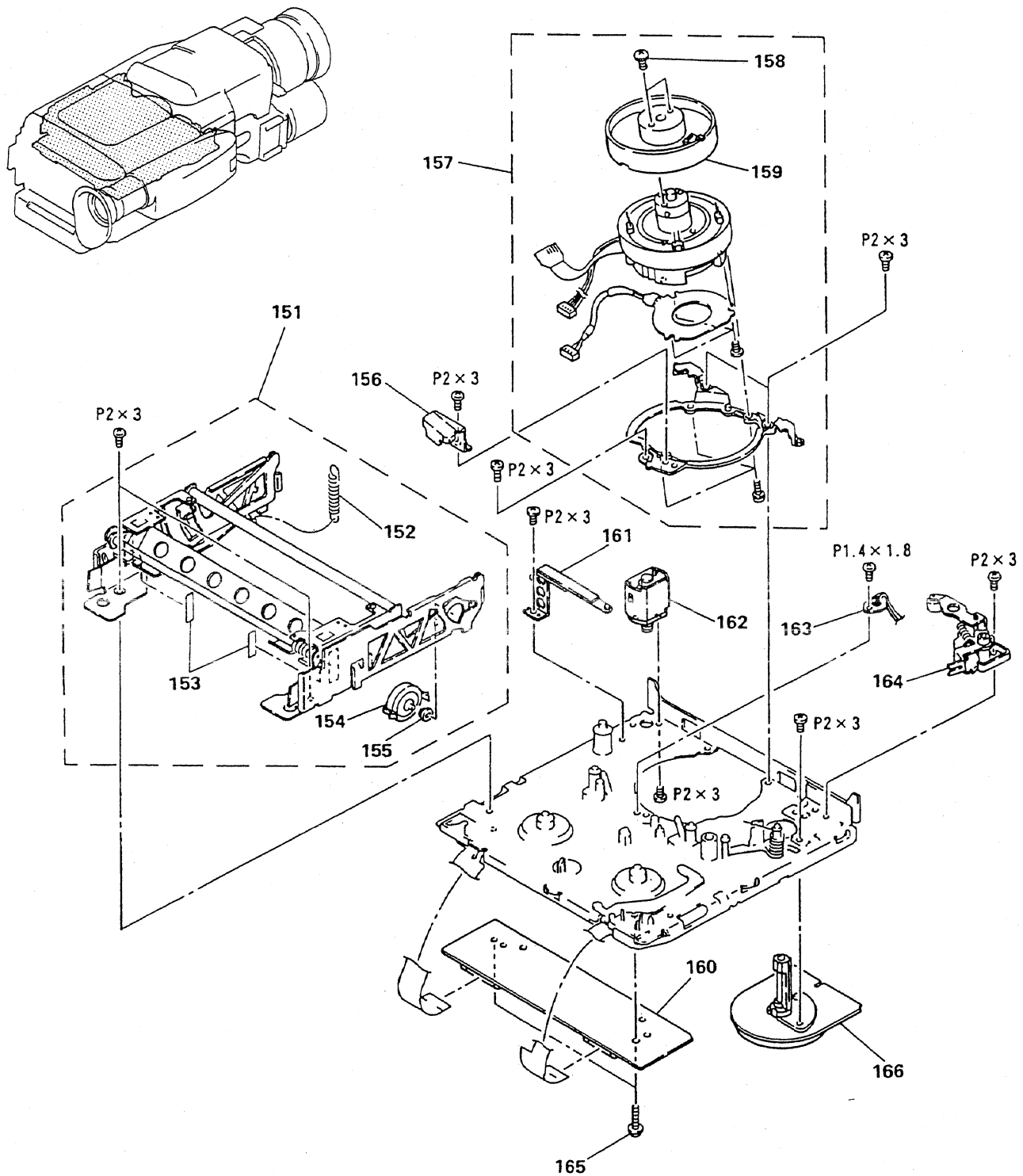
5-4. MAIN BOARD ASSEMBLY

Be sure to read "Precautions for Replacement of CCD Imager" on page 87 when changing the CCD imager.



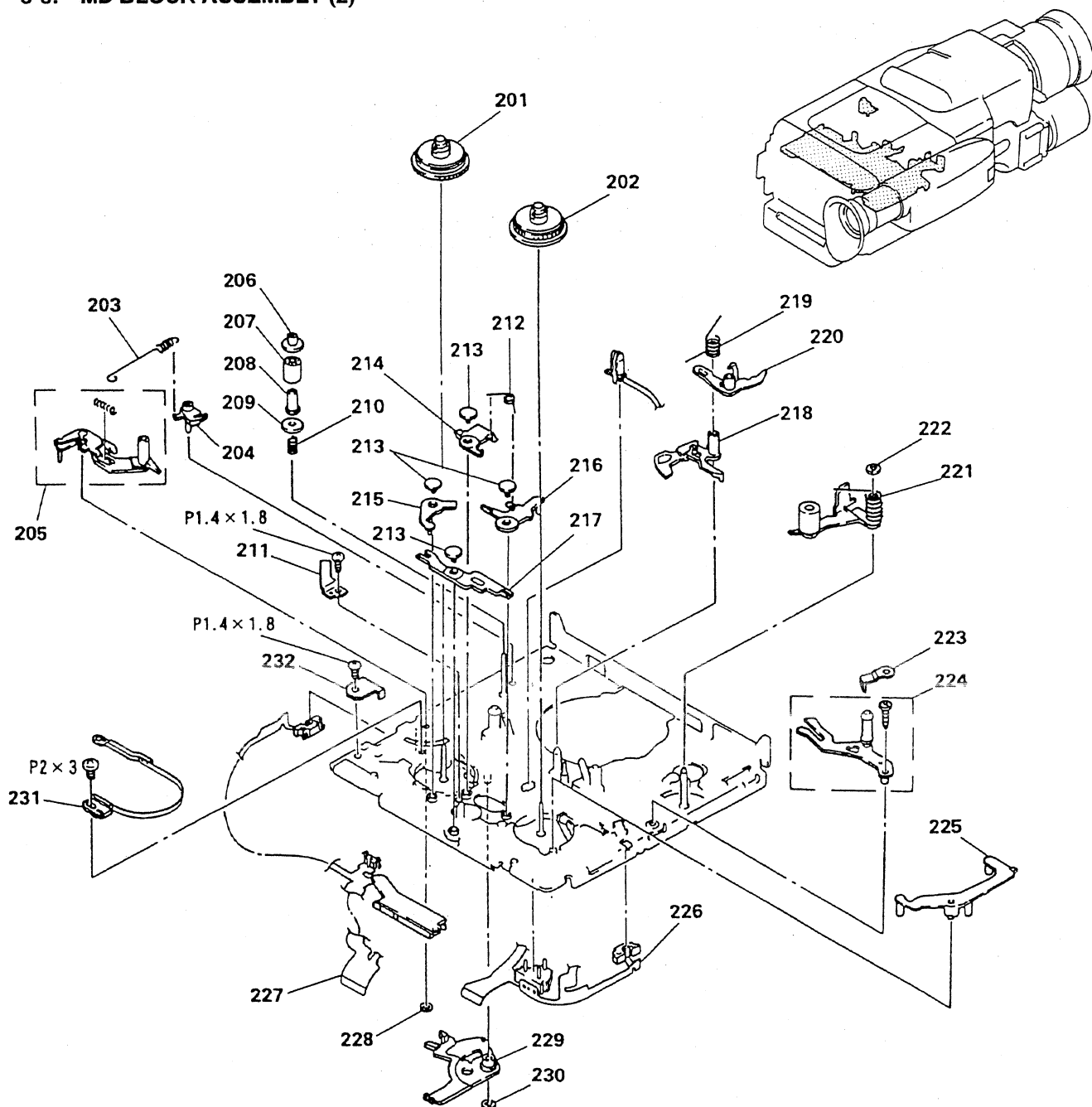
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
101	*A-7061-832-A	CV-8 BOARD, COMPLETE	102-103	120	3-713-790-31	SCREW (M2X8), TAPPING, P3	
102	A-7068-150-A	DT-73A BOARD, COMPLETE (HIC)		121	3-713-790-01	SCREW (M2X6), TAPPING, P3	
103	A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)		122	3-737-744-01	HOLDER (B), LENS	
104	3-719-695-01	SCREW (M1.7X3.5), SPECIAL HEAD		123	*1-631-825-11	DK-4 BOARD	
105	1-568-409-11	JACK, PIN 2P		124	3-719-381-01	SCREW (M2X4)	
106	1-537-142-11	TERMINAL BOARD		125	X-3733-928-1	HOLDER ASSY, LENS	
107	*A-7061-745-A	PS-225 BOARD, COMPLETE		126	*A-7061-739-A	CK-19 BOARD, COMPLETE	
109	*A-7061-380-A	CO-2 BOARD, COMPLETE		127	1-575-064-11	CABLE, FLAT (1.0MM PITCH) 18P	
110	*1-631-828-11	VK-3 BOARD		128	*1-629-372-12	LI-5 BOARD	
111	*3-732-932-01	HOLDER, MD		129	1-550-104-32	HOLDER, BATTERY	
112	3-732-791-01	SCREW (M2X3)		130	A-7090-879-A	FILTER KIT, OPTICAL (OFB-02-02)	
113	*1-631-827-11	KS-6 BOARD		131	A-7030-124-A	IC ICX026BK-2 ASSY (CCD IMAGER)	
114	3-713-790-01	SCREW (M2X5), TAPPING, P3		132	*3-725-180-01	SHEET, INSULATING, CCD HOLDER	
115	3-732-816-01	SCREW, STEP		133	*A-7061-738-A	CD-17 BOARD, COMPLETE	
116	A-7090-806-A	CAP ASSY, HOOD		134	*X-3733-929-1	SHIELD (CD), ASSY, CAMERA	
118	3-728-269-01	HOOD		135	3-303-961-11	WASHER, POLY	
119	1-547-380-11	LENS, ZOOM (VCL-8508XB)		136	3-732-981-01	SCREW (M2X18)	
				137	3-738-519-01	SCREW (M2X3)	

5-5. MD BLOCK ASSEMBLY (1)



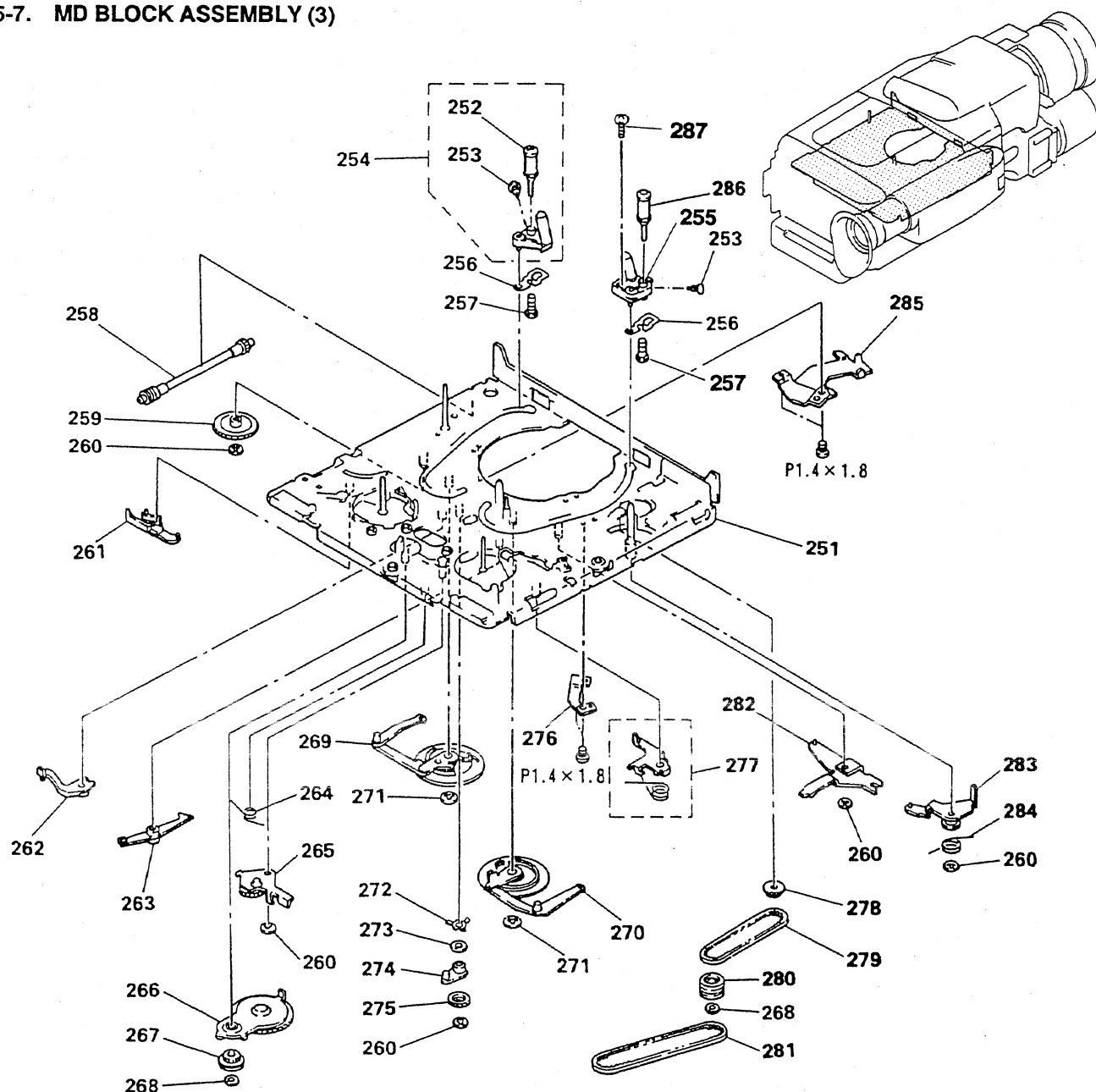
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	X-3726-892-1	CASSETTE COMPARTMENT ASSY (N)		159	A-7049-174-A	DRUM ASSY, UPPER, ROTARY (DGR-26R)	
152	3-728-825-03	SPRING, TENSION		160	*A-7061-744-A	CC-26 BOARD, COMPLETE	
153	*3-728-829-01	TAPE		161	1-535-739-12	TERMINAL, SHAFT EARTH	
154	3-728-867-11	DAMPER, OIL		162	A-7040-160-A	MOTOR ASSY, THREADING (M903)	
155	3-728-828-02	GEAR, DAMPER		163	1-808-505-11	SENSOR (DEW)	
156	3-728-868-01	GUARD, GUIDE		164	A-7040-161-8	ROLLER BLOCK ASSY, HC	
157	A-7048-189-A	DRUM ASSY (DGR-26A-R)		165	3-713-790-01	SCREW (M2X6), TAPPING, P3	
158	3-686-403-01	SCREW (M2X5), P1		166	8-835-331-01	MOTOR, DC U-22A (CAPSTAN) (M902)	

5-6. MD BLOCK ASSEMBLY (2)



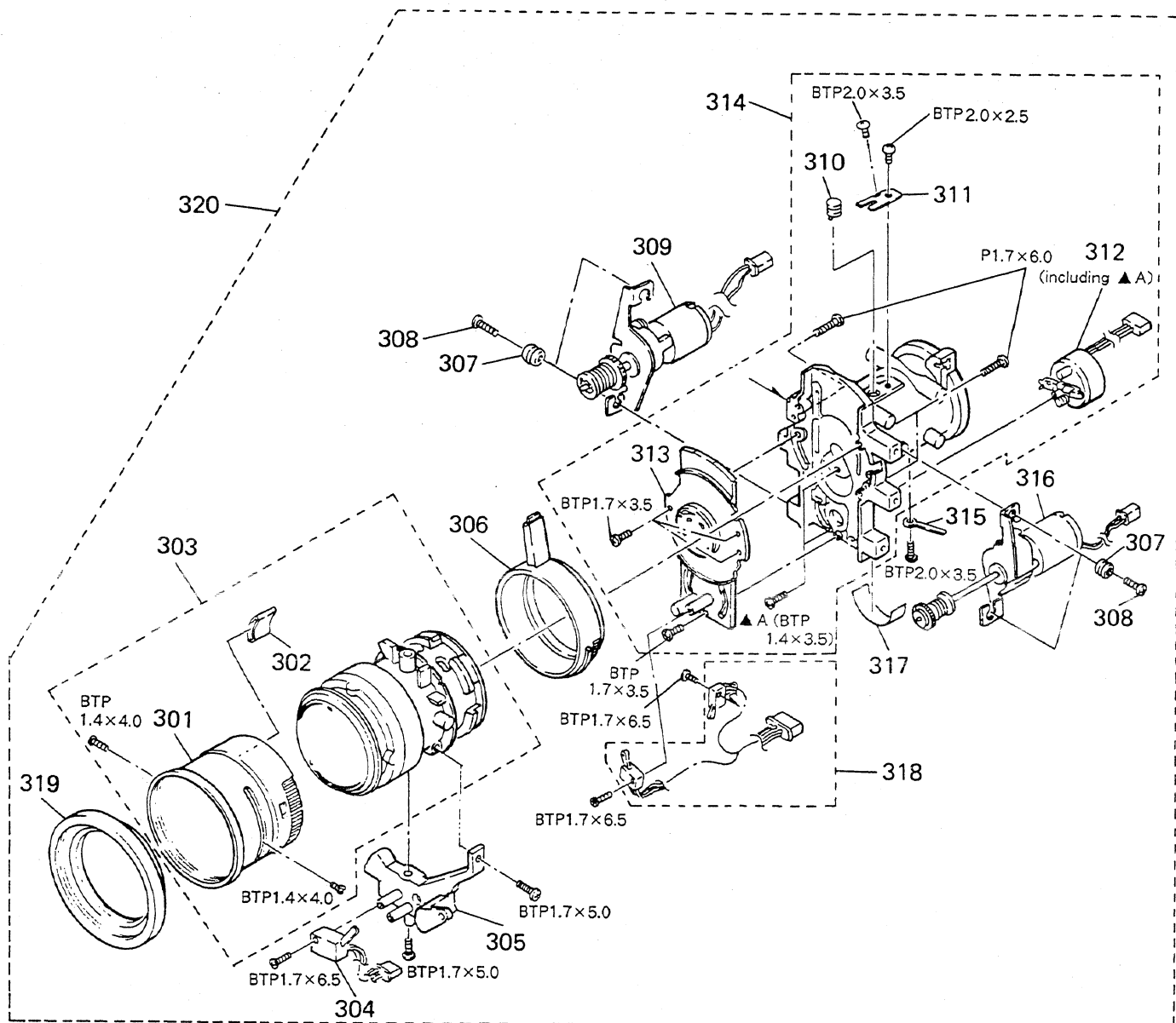
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	X-3726-821-2	TABLE ASSY, REEL, S		217	3-726-853-01	LEVER, LB	
202	X-3726-825-4	TABLE ASSY, REEL, T		218	3-728-875-01	STOPPER, RK	
203	3-736-414-01	SPRING, TENSION		219	3-726-864-01	SPRING (RK), TORSION	
204	3-728-R55-03	ARM, ADJUSTMENT		220	3-728-852-02	ARM, RK STOPPER	
205	X-3726-886-1	ARM ASSY (H) TENSION REGULATOR		221	A-7040-163-B	ARM BLOCK ASSY, PINCH	
206	3-726-884-01	FLANGE, UPPER, TG2		222	3-669-465-00	WASHER (1.5), STOPPER	
207	3-726-883-01	ROLLER, TG2		223	3-728-808-01	SPRING, LEAF	
208	3-726-885-01	SLEEVE, TG2		224	X-3726-822-1	ARM ASSY, TG7	
209	3-726-882-02	FLANGE, LOWER, TG2		225	3-728-848-01	ARM, LB RELEASE	
210	3-726-886-01	SPRING, COMPRESSION		226	1-628-061-12	FP-90 FLEXIBLE BOARD	
211	3-726-848-01	RETAINER, TL		227	1-628-060-12	FP-89 FLEXIBLE BOARD	
212	3-726-866-01	SPRING (ST), TORSION		228	3-321-393-11	WASHER, STOPPER	
213	3-726-898-01	PIN, SHAFT RETAINER		229	X-3726-806-2	LEVER ASSY, SW	
214	3-728-849-01	BRAKE, S		230	3-726-829-01	WASHER, STOPPER	
215	3-726-852-01	BRAKE, LB		231	X-3726-809-1	BAND ASSY, TENSION REGULATOR	
216	3-728-850-01	BRAKE, T		232	3-730-125-01	RETAINER, SW	

5-7. MD BLOCK ASSEMBLY (3)



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
251	X-3726-834-4	CHASSIS ASSY, MECHANICAL		271	3-669-465-00	WASHER (1.5), STOPPER	
252	X-3726-820-1	ROLLER ASSY (U), GUIDE		272	3-726-867-01	SPRING, LEAF	
253	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD		273	3-701-436-21	WASHER, POLYETHYLENE	
254	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	252, 253	274	3-726-857-02	ARM, UL	
255	X-3728-811-1	COASTER (RIGHT) ASSY		275	3-726-856-02	GEAR, UL	
256	3-726-820-02	SPRING, LEAF		276	*3-726-805-01	REINFORCEMENT (TT)	
257	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)		277	X-3726-808-2	BRAKE ASSY, TS	
258	X-3726-807-1	WORM ASSY		278	X-3726-805-1	GEAR ASSY, JOINT	
259	3-726-826-01	GEAR, WHEEL		279	3-728-866-11	BELT (S), TIMING	
260	3-726-829-01	WASHER, STOPPER		280	X-3726-838-1	PULLEY (UPPER) ASSY, MIDWAY	
261	3-728-842-01	LEVER, EJECT		281	3-728-865-11	BELT (L), TIMING	
262	3-728-851-01	BRAKE, UL		282	X-3726-804-1	LEVER ASSY, THREADING	
263	3-726-854-01	ARM, BRAKE RELEASE		283	X-3726-824-1	ARM ASSY, PINCH SUB	
264	3-726-865-01	SPRING (LB), TORSION		284	3-726-895-01	SPRING	
265	A-7040-130-A	GEAR BLOCK ASSY, LB		285	X-3726-841-1	REINFORCEMENT (SS) ASSY	
266	X-3726-802-2	GEAR ASSY, RK		286	X-3728-810-1	POLLER ASSY (U) (PLATING),GUIDE	
267	X-3726-812-1	GEAR ASSY, RC		287	3-736-473-01	SCREW (2x6.5)(SLIT)(LONG LOCK)	
268	3-321-393-11	WASHER, STOPPER					
269	X-3726-830-2	GEAR (LEFT) ASSY, DRIVE					
270	X-3726-831-2	GEAR (RIGHT) ASSY, DRIVE					

5-8. LENS BLOCK



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
301	3-707-812-01	RING (F)	301, 302	311	3-707-798-01	CLAMP, PIN	310-313
302	3-707-801-01	RUBBER, STOPPER (F)		312	3-707-810-01	METER, IRIS	
303	3-707-808-01	TUBE ASSY		313	3-707-809-01	FRAME ASSY, LENS	
304	3-707-805-01	SWITCH ASSY, AF		314	3-707-807-01	TUBE ASSY, REAR	
305	3-707-806-01	BRACKET		315	3-707-799-01	PLATE, LUG	
306	3-707-811-01	RING ASSY, ZOOM		316	3-707-803-01	MOTOR ASSY, AF GEAR	301-319
307	3-707-795-01	RUBBER, VIBRATION PROOF		317	3-707-800-01	TAPE	
308	3-707-796-01	SCREW, FITTING (M)		318	3-707-804-01	PZ SWITCH ASSY	
309	3-707-802-01	MOTOR ASSY, PZ GEAR		319	3-707-568-01	ADAPTOR, LENS HOOD	
310	3-707-797-01	PIN		320	1-547-380-11	LENS, ZOOM (VCL-B508XB)	

SECTION 6 ELECTRICAL PARTS LIST

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NOTE:

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms
METAL : Metal-film resistor
METAL OXIDE : Metal Oxide-film resistor
F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, U : μ , for example:
UA... : μ A..., UPA... : μ PA...,
UPB... : μ PB..., UPC... : μ PC...,
UPD... : μ PD...
- CAPACITORS
MF : μ F, PF : μ MF
- COILS
MMH : mH, UH : μ H

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
*A-7061-380-A CO-2 BOARD, COMPLETE (Ref.No 6,000 Series) *****							
CAPACITOR							
C101	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C410	1-126-207-11	ELECT CHIP 33MF	20% 4V
C102	1-164-247-11	CERAMIC CHIP 0.07MF	10% 16V	C411	1-126-207-11	ELECT CHIP 33MF	20% 4V
C103	1-164-247-11	CERAMIC CHIP 0.07MF	10% 16V	C412	1-162-638-11	CERAMIC CHIP 1MF	16V
C104	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C413	1-162-638-11	CERAMIC CHIP 1MF	16V
C105	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C414	1-126-205-11	ELECT CHIP 47MF	20% 6.3V
C106	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C415	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C108	1-163-123-00	CERAMIC CHIP 180PF	5% 50V	C416	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V
C109	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C417	1-163-017-00	CERAMIC CHIP 0.0047MF	10% 50V
C110	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C418	1-126-206-11	ELECT CHIP 100MF	20% 6.3V
C111	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C420	1-162-638-11	CERAMIC CHIP 1MF	16V
C112	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C421	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C113	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C501	1-124-779-00	ELECT CHIP 10MF	20% 16V
C114	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C503	1-163-095-00	CERAMIC CHIP 12PF	5% 50V
C115	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C504	1-163-095-00	CERAMIC CHIP 12PF	5% 50V
C116	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V	C505	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C117	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C506	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C118	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C507	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C119	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C508	1-124-779-00	ELECT CHIP 10MF	20% 16V
C123	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C509	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C124	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C510	1-124-779-00	ELECT CHIP 10MF	20% 16V
C125	1-163-037-11	CERAMIC CHIP 0.022MF	10% 25V	C511	1-124-779-00	ELECT CHIP 10MF	20% 16V
C126	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C512	1-126-204-11	ELECT CHIP 47MF	20% 16V
C131	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C513	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V
C132	1-163-121-00	CERAMIC CHIP 150PF	5% 50V	C514	1-136-718-11	FILM CHIP 0.1MF	5% 25V
C133	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	C515	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C134	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C516	1-124-779-00	ELECT CHIP 10MF	20% 16V
C135	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C517	1-124-779-00	ELECT CHIP 10MF	20% 16V
C136	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C518	1-126-195-11	ELECT CHIP 2.2MF	20% 50V
C138	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C519	1-124-779-00	ELECT CHIP 10MF	20% 16V
C139	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C520	1-124-779-00	ELECT CHIP 10MF	20% 16V
C140	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C521	1-126-193-11	ELECT CHIP 1MF	20% 50V
C141	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C522	1-126-193-11	ELECT CHIP 1MF	20% 50V
C145	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C523	1-124-779-00	ELECT CHIP 10MF	20% 16V
C148	1-163-007-11	CERAMIC CHIP 680PF	10% 50V	C524	1-126-193-11	ELECT CHIP 1MF	20% 50V
C149	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C525	1-124-779-00	ELECT CHIP 10MF	20% 16V
C160	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C526	1-126-204-11	ELECT CHIP 47MF	20% 16V
C161	1-126-204-11	ELECT CHIP 47MF	20% 16V	C527	1-127-539-11	ELECT(SOLID) 1MF	20% 25V
C162	1-163-133-00	CERAMIC CHIP 470PF	5% 50V	C528	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C163	1-164-247-11	CERAMIC CHIP 0.047MF	10% 16V	C529	1-124-779-00	ELECT CHIP 10MF	20% 16V
C165	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C530	1-163-077-00	CERAMIC CHIP 0.1MF	10% 25V
C166	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C531	1-163-077-00	CERAMIC CHIP 0.1MF	10% 25V
C401	1-126-195-11	ELECT CHIP 2.2MF	20% 50V	C532	1-163-077-00	CERAMIC CHIP 0.1MF	10% 25V
C403	1-126-206-11	ELECT CHIP 100MF	20% 6.3V	C533	1-124-779-00	ELECT CHIP 10MF	20% 16V
C404	1-126-206-11	ELECT CHIP 100MF	20% 6.3V	C534	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C405	1-126-198-11	ELECT CHIP 4.7MF	20% 35V	C535	1-124-779-00	ELECT CHIP 10MF	20% 16V
C406	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C536	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C407	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	C537	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C408	1-162-638-11	CERAMIC CHIP 1MF	16V	C538	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C409	1-126-206-11	ELECT CHIP 100MF	20% 6.3V	C539	1-163-037-11	CERAMIC CHIP 0.022MF	10% 25V
				C540	1-163-037-11	CERAMIC CHIP 0.022MF	10% 25V
				C541	1-163-105-00	CERAMIC CHIP 33PF	5% 50V
				C542	1-163-105-00	CERAMIC CHIP 33PF	5% 50V
				C543	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
<u>IC LINK</u>							
PS503	1-532-685-00	LINK, IC					
<u>TRANSISTOR</u>							
Q102	8-729-100-66	TRANSISTOR 2SC1623		Q621	8-729-805-43	TRANSISTOR 2SC3396	
Q108	8-729-805-69	TRANSISTOR 2SA1341		Q622	8-729-100-66	TRANSISTOR 2SC1623	
Q109	8-729-100-66	TRANSISTOR 2SC1623		Q623	8-729-805-25	TRANSISTOR 2SB1121	
Q110	8-729-100-66	TRANSISTOR 2SC1623		Q624	8-729-901-01	TRANSISTOR DTC144EK	
Q111	8-729-216-22	TRANSISTOR 2SA1162		Q625	8-729-805-65	TRANSISTOR 2SA1344	
Q112	8-729-119-76	TRANSISTOR 2SA1175-HFE		<u>RESISTOR</u>			
Q113	8-729-216-22	TRANSISTOR 2SA1162		R102	1-216-101-00	METAL GLAZE 150K 5%	1/10W
Q114	8-729-901-01	TRANSISTOR DTC144EK		R103	1-216-041-00	METAL GLAZE 470 5%	1/10W
Q116	8-729-805-69	TRANSISTOR 2SA1341		R104	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
Q401	8-729-100-66	TRANSISTOR 2SC1623		R106	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
Q402	8-729-100-66	TRANSISTOR 2SC1623		R110	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q403	8-729-805-69	TRANSISTOR 2SA1341		R113	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
Q404	8-729-901-01	TRANSISTOR DTC144EK		R114	1-216-083-00	METAL GLAZE 27K 5%	1/10W
Q405	8-729-805-69	TRANSISTOR 2SA1341		R115	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q406	8-729-100-66	TRANSISTOR 2SC1623		R116	1-216-085-00	METAL GLAZE 33K 5%	1/10W
Q503	8-729-805-39	TRANSISTOR 2SC3898		R117	1-216-085-00	METAL GLAZE 33K 5%	1/10W
Q504	8-729-805-39	TRANSISTOR 2SC3898		R118	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q506	8-729-216-22	TRANSISTOR 2SA1162		R119	1-216-083-00	METAL GLAZE 27K 5%	1/10W
Q507	8-729-216-22	TRANSISTOR 2SA1162		R120	1-216-085-00	METAL GLAZE 33K 5%	1/10W
Q515	8-729-216-22	TRANSISTOR 2SA1162		R121	1-216-077-00	METAL GLAZE 15K 5%	1/10W
Q516	8-729-100-66	TRANSISTOR 2SC1623		R122	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
Q517	8-729-100-66	TRANSISTOR 2SC1623		R123	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q518	8-729-100-66	TRANSISTOR 2SC1623		R124	1-216-013-00	METAL GLAZE 33 5%	1/10W
Q519	8-729-100-66	TRANSISTOR 2SC1623		R125	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q520	8-729-104-95	TRANSISTOR 2SB1040A-4		R126	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
Q521	8-729-100-66	TRANSISTOR 2SC1623		R127	1-216-035-00	METAL GLAZE 270 5%	1/10W
Q522	8-729-216-22	TRANSISTOR 2SA1162		R128	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q524	8-729-100-66	TRANSISTOR 2SC1623		R129	1-216-089-00	METAL GLAZE 47K 5%	1/10W
Q525	8-729-100-66	TRANSISTOR 2SC1623		R130	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q526	8-729-216-22	TRANSISTOR 2SA1162		R131	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
Q527	8-729-100-66	TRANSISTOR 2SC1623		R132	1-216-073-00	METAL GLAZE 10K 5%	1/10W
Q528	8-729-216-22	TRANSISTOR 2SA1162		R133	1-216-019-00	METAL GLAZE 56 5%	1/10W
Q529	8-729-100-66	TRANSISTOR 2SC1623		R134	1-216-035-00	METAL GLAZE 270 5%	1/10W
Q530	8-729-216-22	TRANSISTOR 2SA1162		R135	1-216-033-00	METAL GLAZE 220 5%	1/10W
Q531	8-729-216-22	TRANSISTOR 2SA1162		R136	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q532	8-729-216-22	TRANSISTOR 2SA1162		R137	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q533	8-729-216-22	TRANSISTOR 2SA1162		R138	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
Q534	8-729-901-01	TRANSISTOR DTC144EK		R139	1-216-043-00	METAL GLAZE 560 5%	1/10W
Q535	8-729-901-01	TRANSISTOR DTC144EK		R140	1-216-041-00	METAL GLAZE 470 5%	1/10W
Q536	8-729-805-39	TRANSISTOR 2SC3898		R141	1-216-097-00	METAL GLAZE 100K 5%	1/10W
Q537	8-729-216-22	TRANSISTOR 2SA1162		R143	1-216-095-00	METAL GLAZE 82K 5%	1/10W
Q538	8-729-100-66	TRANSISTOR 2SC1623		R151	1-216-101-00	METAL GLAZE 150K 5%	1/10W
Q539	8-729-100-66	TRANSISTOR 2SC1623		R152	1-216-013-00	METAL GLAZE 33 5%	1/10W
Q540	8-729-100-66	TRANSISTOR 2SC1623		R155	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
<u>IC</u>				R156	1-216-041-00	METAL GLAZE 470 5%	1/10W
IC601	8-752-603-54	IC ICX026BK-2 (CCD IMAGER)		R157	1-216-085-00	METAL GLAZE 33K 5%	1/10W
				R158	1-216-039-00	METAL GLAZE 390 5%	1/10W
				R160	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R161	1-216-013-00	METAL GLAZE 33	5% 1/10W	R535	1-216-121-00	METAL GLAZE 1M	5% 1/10W
R401	1-216-041-00	METAL GLAZE 470	5% 1/10W	R536	1-216-075-00	METAL GLAZE 12K	5% 1/10W
R402	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R537	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R403	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R538	1-216-077-00	METAL GLAZE 15K	5% 1/10W
R404	1-216-053-00	METAL GLAZE 1.5K	5% 1/10W	R539	1-216-121-00	METAL GLAZE 1M	5% 1/10W
R405	1-216-081-00	METAL GLAZE 22K	5% 1/10W	R540	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R407	1-216-081-00	METAL GLAZE 22K	5% 1/10W	R541	1-216-089-00	METAL GLAZE 47K	5% 1/10W
R408	1-216-081-00	METAL GLAZE 22K	5% 1/10W	R542	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R409	1-216-121-00	METAL GLAZE 1M	5% 1/10W	R543	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R410	1-216-011-00	METAL GLAZE 27	5% 1/10W	R544	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R411	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R545	1-216-113-00	METAL GLAZE 470K	5% 1/10W
R415	1-216-085-00	METAL GLAZE 33K	5% 1/10W	R546	1-216-089-00	METAL GLAZE 47K	5% 1/10W
R416	1-216-063-00	METAL GLAZE 3.9K	5% 1/10W	R547	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R417	1-216-089-00	METAL GLAZE 47K	5% 1/10W	R548	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R418	1-216-061-00	METAL GLAZE 3.3K	5% 1/10W	R549	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R419	1-216-057-00	METAL GLAZE 2.2K	5% 1/10W	R550	1-216-113-00	METAL GLAZE 470K	5% 1/10W
R421	1-216-057-00	METAL GLAZE 2.2K	5% 1/10W	R551	1-216-049-00	METAL GLAZE 1K	5% 1/10W
R422	1-216-049-00	METAL GLAZE 1K	5% 1/10W	R552	1-216-105-00	METAL GLAZE 220K	5% 1/10W
R423	1-216-049-00	METAL GLAZE 1K	5% 1/10W	R553	1-216-105-00	METAL GLAZE 220K	5% 1/10W
R430	1-216-295-00	METAL GLAZE 0	5% 1/10W	R554	1-216-182-00	METAL GLAZE 220	5% 1/8W
R431	1-216-295-00	METAL GLAZE 0	5% 1/10W	R555	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R501	1-216-295-00	METAL GLAZE 0	5% 1/10W	R556	1-216-071-00	METAL GLAZE 8.2K	5% 1/10W
R502	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R557	1-216-051-00	METAL GLAZE 1.2K	5% 1/10W
R503	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R558	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R504	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R559	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R505	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R560	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R506	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R561	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R507	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R562	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R508	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R563	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R509	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R564	1-216-097-00	METAL GLAZE 100K	5% 1/10W
R510	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R565	1-216-109-00	METAL GLAZE 330K	5% 1/10W
R511	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R566	1-216-121-00	METAL GLAZE 1M	5% 1/10W
R512	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R567	1-216-111-00	METAL GLAZE 390K	5% 1/10W
R513	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R568	1-216-113-00	METAL GLAZE 470K	5% 1/10W
R514	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R570	1-216-073-00	METAL GLAZE 10K	5% 1/10W
R515	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R571	1-216-049-00	METAL GLAZE 1K	5% 1/10W
R516	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R572	1-216-121-00	METAL GLAZE 1M	5% 1/10W
R517	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R574	1-216-047-00	METAL GLAZE 820	5% 1/10W
R518	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R575	1-216-101-00	METAL GLAZE 150K	5% 1/10W
R519	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R576	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R520	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R577	1-216-081-00	METAL GLAZE 22K	5% 1/10W
R521	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R578	1-216-081-00	METAL GLAZE 22K	5% 1/10W
R522	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R579	1-216-025-00	METAL GLAZE 100	5% 1/10W
R523	1-216-073-00	METAL GLAZE 10K	5% 1/10W	R580	1-216-035-00	METAL GLAZE 270	5% 1/10W
R524	1-216-097-00	METAL GLAZE 100K	5% 1/10W	R581	1-216-077-00	METAL GLAZE 15K	5% 1/10W
R525	1-216-691-11	METAL CHIP 47K	0.50% 1/10W	R582	1-216-298-00	METAL GLAZE 2.2	5% 1/10W
R526	1-216-691-11	METAL CHIP 47K	0.50% 1/10W	R583	1-216-298-00	METAL GLAZE 2.2	5% 1/10W
R528	1-216-117-00	METAL GLAZE 680K	5% 1/10W	R584	1-216-298-00	METAL GLAZE 2.2	5% 1/10W
R530	1-216-077-00	METAL GLAZE 15K	5% 1/10W	R585	1-216-041-00	METAL GLAZE 470	5% 1/10W
R531	1-216-049-00	METAL GLAZE 1K	5% 1/10W	R586	1-216-041-00	METAL GLAZE 470	5% 1/10W
R532	1-216-069-00	METAL GLAZE 6.8K	5% 1/10W	R587	1-216-085-00	METAL GLAZE 33K	5% 1/10W
R533	1-216-109-00	METAL GLAZE 330K	5% 1/10W	R588	1-216-748-11	METAL GLAZE 39K	5% 1/10W
R534	1-216-085-00	METAL GLAZE 33K	5% 1/10W	R589	1-216-043-00	METAL GLAZE 560	5% 1/10W

When indicating parts by reference number, please include the board name.

CO-2 VF-22

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R590	1-216-035-00	METAL GLAZE 270 5%	1/10W	R643	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
R591	1-216-031-00	METAL GLAZE 180 5%	1/10W	R644	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W
R592	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R645	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R593	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W	R652	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R594	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R653	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R595	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R654	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R596	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R655	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R597	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R656	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R598	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R657	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R599	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R658	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R600	1-216-121-00	METAL GLAZE 1M 5%	1/10W	R659	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R601	1-216-047-00	METAL GLAZE 820 5%	1/10W	R660	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R602	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R661	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R603	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R663	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R604	1-216-085-00	METAL GLAZE 33K 5%	1/10W	R664	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R605	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R665	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R606	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R666	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R607	1-216-021-00	METAL GLAZE 68 5%	1/10W	R667	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R608	1-216-029-00	METAL GLAZE 150 5%	1/10W	R668	1-216-041-00	METAL GLAZE 470 5%	1/10W
R609	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W	R669	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R610	1-216-121-00	METAL GLAZE 1M 5%	1/10W	R670	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R611	1-216-083-00	METAL GLAZE 27K 5%	1/10W	R671	1-216-295-00	METAL GLAZE 0 5%	1/10W
R612	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	VARIABLE RESISTOR			
R613	1-216-083-00	METAL GLAZE 27K 5%	1/10W	RV101	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
R614	1-216-095-00	METAL GLAZE 82K 5%	1/10W	RV102	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
R615	1-216-073-00	METAL GLAZE 10K 5%	1/10W	RV501	1-230-874-11	RES, ADJ, METAL GLAZE 100K	
R616	1-216-097-00	METAL GLAZE 100K 5%	1/10W	RV502	1-230-876-11	RES, ADJ, METAL GLAZE 470K	
R617	1-216-097-00	METAL GLAZE 100K 5%	1/10W	RV551	1-238-225-11	RES, ADJ, METAL GLAZE 47K	
R618	1-216-077-00	METAL GLAZE 15K 5%	1/10W	RV621	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K	
R619	1-216-109-00	METAL GLAZE 330K 5%	1/10W	CONNECTOR			
R620	1-216-083-00	METAL GLAZE 27K 5%	1/10W	W501	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 22P	
R621	1-216-089-00	METAL GLAZE 47K 5%	1/10W	W502	1-574-451-11	CABLE, FLAT (1.0MM PITCH) 22P	
R622	1-216-097-00	METAL GLAZE 100K 5%	1/10W	CRYSTAL			
R623	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W	X501	1-577-116-11	VIBRATOR, CRYSTAL (16MHz)	
R624	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W	X502	1-567-700-11	VIBRATOR, CRYSTAL (5.9MHz)	
R625	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W	*****			
R626	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W	*A-7061-558-A VF-22 BOARD, COMPLETE (Ref.No 4,000 Series)			
R627	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W	*****			
R628	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	CAPACITOR			
R629	1-216-089-00	METAL GLAZE 47K 5%	1/10W	C901	1-126-369-11	ELECT 220MF 20% 6.3V	
R630	1-216-045-00	METAL GLAZE 680 5%	1/10W	C902	1-163-038-00	CERAMIC CHIP 0.1MF 25V	
R631	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W	C904	1-127-515-11	ELECT(SOLID) 47MF 20% 6.3V	
R632	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W	C905	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
R633	1-216-073-00	METAL GLAZE 10K 5%	1/10W	C906	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
R634	1-216-033-00	METAL GLAZE 220 5%	1/10W	C907	1-162-625-11	CERAMIC CHIP 0.0047MF 5% 50V	
R635	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	C908	1-163-015-00	CERAMIC CHIP 0.0033MF 10% 50V	
R636	1-216-089-00	METAL GLAZE 47K 5%	1/10W	C909	1-126-193-11	ELECT CHIP 1MF 20% 50V	
R637	1-216-045-00	METAL GLAZE 680 5%	1/10W				
R638	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W				
R639	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W				
R640	1-216-097-00	METAL GLAZE 100K 5%	1/10W				
R641	1-216-136-00	METAL GLAZE 2.7 5%	1/8W				
R642	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W				

The components identified by mark **A** or dotted line with mark **A** are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque **A** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

VF-22 LD-17 VF-14

Ref.No	Part No.	Description	Remark
C911	1-131-388-00	TANTALUM 68MF	10%
C912	1-102-038-00	CERAMIC 0.001MF	500V
C913	1-163-033-00	CERAMIC CHIP 0.022MF	50V
C915	1-126-193-11	ELECT CHIP 1MF	20% 50V
C916	1-163-037-11	CERAMIC CHIP 0.022MF	10% 25V
C917	1-135-166-21	TANTAL. CHIP 47MF	20% 6.3V
C918	1-162-638-11	CERAMIC CHIP 1MF	16V
C919	1-135-070-00	TANTAL. CHIP 0.1MF	10% 35V
C920	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V

CONNECTOR

CN901	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
CN904	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P

COMPOSITION CIRCUIT BLOCK

CP901	1-238-119-11	RES, ADJ
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SOCKET

CRT901	1-526-978-21	SOCKET ASSY, CRT
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DIODE

D903	8-719-400-20	DIODE MA152WA
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IC

IC901	8-759-420-01	IC AN2512S
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COIL

L901	1-408-421-00	INDUCTOR 100UH
L902	1-410-379-21	INDUCTOR CHIP 6.8UH
L903	1-459-858-11	COIL, FERRITE (HLC)

TRANSISTOR

Q902	8-729-402-31	TRANSISTOR 2SD1819A-Q
Q903	1-8-729-106-68	TRANSISTOR 2SD1615A-GP
Q904	8-729-216-32	TRANSISTOR 2SA1163

RESISTOR

R902	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
R903	1-216-041-00	METAL GLAZE 470 5%	1/10W
R904	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R906	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
R907	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R908	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R909	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R911	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R912	1-216-295-00	METAL GLAZE 0 5%	1/10W
R913	1-216-295-00	METAL GLAZE 0 5%	1/10W
R914	1-216-133-00	METAL GLAZE 3.3M 5%	1/10W
R915	1-216-133-00	METAL GLAZE 3.3M 5%	1/10W
R916	1-216-125-00	METAL GLAZE 1.5M 5%	1/10W
R917	1-216-121-00	METAL GLAZE 1M 5%	1/10W

Ref.No	Part No.	Description	Remark
R919	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R920	1-216-113-00	METAL GLAZE 470K 5%	1/10W
R921	1-216-013-00	METAL GLAZE 33 5%	1/10W
R922	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W
R923	1-216-025-00	METAL GLAZE 100 5%	1/10W
R924	1-216-306-11	METAL GLAZE 3.9 5%	1/10W
R925	1-216-336-11	METAL GLAZE 47K 1%	1/10W
R926	1-218-163-11	METAL GLAZE 120K 1%	1/10W
R928	1-216-870-11	METAL GLAZE 180K 1%	1/10W
R929	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R930	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R931	1-216-121-00	METAL GLAZE 1M 5%	1/10W

VARIABLE RESISTOR

RV901	1-238-647-11	RES, ADJ, METAL GLAZE 4.7M
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TRANSFORMER

T901	1-439-428-11	TRANSFORMER ASSY, FLYBACK
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THERMISTOR

TH901	1-807-938-11	THERMISTOR 500
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*1-630-067-11 LD-17 BOARD (Ref.No 5,000 Series)

*3-674-372-00 HOLDER (A), LED

DIODE

D901	8-719-941-34	DIODE GL1HD51
D902	8-719-812-41	DIODE TLR124

*A-7061-560-A VF-14 BOARD, COMPLETE (Ref.No 7,000 Series)

CAPACITOR

C901	1-124-442-00	ELECT 330MF	20%	6.3V
C903	1-163-077-00	CERAMIC CHIP 0.1MF		50V
C904	1-126-160-11	ELECT 1MF	20%	50V
C905	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V
C906	1-131-381-00	TANTALUM 47MF	10%	6.3V
C907	1-162-638-11	CERAMIC CHIP 1MF		16V
C908	1-136-165-00	FILM 0.1MF	5%	50V
C909	1-163-105-00	CERAMIC CHIP 33PF	5%	50V
C910	1-124-587-11	ELECT 220MF	20%	6.3V
C911	1-163-141-00	CERAMIC CHIP 0.001MF	5%	50V
C912	1-162-625-11	CERAMIC CHIP 0.0047MF	5%	50V
C913	1-162-625-11	CERAMIC CHIP 0.0047MF	5%	50V
C914	1-163-209-00	CERAMIC CHIP 0.0015MF	5%	50V
C915	1-126-090-11	ELECT 82MF	20%	10V
C916	1-126-160-11	ELECT 1MF	20%	50V

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

VF-14 LD-13 PS-225

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C918	1-163-037-11	CERAMIC CHIP 0.022MF	10%	R931	1-216-041-00	METAL GLAZE 470	5% 1/10W
C919	1-102-038-00	CERAMIC 0.001MF	500V	R932	1-216-047-00	METAL GLAZE 820	5% 1/10W
<u>CONNECTOR</u>				R933	1-216-121-00	METAL GLAZE 1M	5% 1/10W
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P		<u>VARIABLE RESISTOR</u>			
CN903	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P		RV901	1-230-873-11	RES, ADJ, METAL GLAZE 47K	
CN904	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P		RV902	1-230-866-11	RES, ADJ, METAL GLAZE 470	
<u>DIODE</u>				RV904	1-228-762-00	RES, ADJ, METAL GLAZE 1M	
D903	8-719-400-20	DIODE MA152WA		<u>TRANSFORMER</u>			
<u>IC</u>				T901	△ 1-439-431-11	TRANSFORMER ASSY, FLYBACK	
IC901	8-759-420-01	IC AN2512S		<u>THERMISTOR</u>			
<u>COIL</u>				TH901	1-807-938-11	THERMISTOR 500	
L901	1-410-831-21	INDUCTOR 82UH		<u>SOCKET</u>			
L902	1-408-976-21	INDUCTOR 33UH		W901	△ 1-540-019-21	SOCKET ASSY, CRT	
L903	△ 1-459-858-11	COIL, FERRITE (HLC)		*****			
<u>TRANSISTOR</u>				*1-629-384-11	LD-13 BOARD (Ref.No 8,000 Series)		
Q902	△ 8-729-100-66	TRANSISTOR 2SC1623		*****			
Q903	8-729-216-32	TRANSISTOR 2SA1163		*3-674-372-00	HOLDER (A), LED		
Q904	8-729-100-66	TRANSISTOR 2SC1623		<u>DIODE</u>			
Q905	△ 8-729-106-68	TRANSISTOR 2SD1615A-GP		D901	8-719-941-34	DIODE GL1HD51	
<u>RESISTOR</u>				D902	8-719-812-41	DIODE GL3PR8	
R901	1-216-073-00	METAL GLAZE 10K	5% 1/10W	*****			
R903	1-216-041-00	METAL GLAZE 470	5% 1/10W	*A-7061-745-A	PS-225 BOARD, COMPLETE (Ref.No 1,000 Series)		
R904	1-216-051-00	METAL GLAZE 1.2K	5% 1/10W	*****			
R905	1-216-007-00	METAL GLAZE 18	5% 1/10W	<u>CAPACITOR</u>			
R906	1-216-121-00	METAL GLAZE 1M	5% 1/10W	C936	1-124-438-00	ELECT 1MF	20% 50V
R908	1-216-097-00	METAL GLAZE 100K	5% 1/10W	C937	1-124-438-00	ELECT 1MF	20% 50V
R909	1-216-113-00	METAL GLAZE 470K	5% 1/10W	C938	1-163-809-11	CERAMIC CHIP 0.047MF	10% 25V
R910	1-216-053-00	METAL GLAZE 1.5K	5% 1/10W	C939	1-124-438-00	ELECT 1MF	20% 50V
R911	1-216-013-00	METAL GLAZE 33	5% 1/10W	C940	1-164-161-11	CERAMIC CHIP 0.0022MF	50V
R912	1-216-691-11	METAL CHIP 47K	0.50% 1/10W	C941	1-127-558-11	ELECT(SOLID) 10MF	20% 10V
R913	1-218-163-11	METAL GLAZE 120K	1% 1/10W	C942	1-163-125-00	CERAMIC CHIP 220PF	10% 50V
R914	1-216-025-00	METAL GLAZE 100	5% 1/10W	C943	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
R915	1-216-306-11	METAL GLAZE 3.9	5% 1/10W	C944	1-127-561-11	ELECT(SOLID) 33MF	20% 10V
R917	1-216-047-00	METAL GLAZE 820	5% 1/10W	C945	1-162-637-11	CERAMIC CHIP 0.47MF	16V
R918	1-216-069-00	METAL GLAZE 6.8K	5% 1/10W	C955	1-127-558-11	ELECT(SOLID) 10MF	20% 10V
R919	1-216-748-11	METAL GLAZE 39K	5% 1/10W	C957	1-124-589-11	ELECT 47MF	20% 10V
R920	1-216-748-11	METAL GLAZE 39K	5% 1/10W	C958	1-124-589-11	ELECT 47MF	20% 10V
R921	1-216-053-00	METAL GLAZE 1.5K	5% 1/10W	C959	1-124-589-11	ELECT 47MF	20% 10V
R922	1-216-101-00	METAL GLAZE 150K	5% 1/10W	C961	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
R923	1-216-121-00	METAL GLAZE 1M	5% 1/10W	C962	1-163-033-00	CERAMIC CHIP 0.022MF	50V
R924	1-216-131-11	METAL GLAZE 2.7M	5% 1/10W	C963	1-163-125-00	CERAMIC CHIP 220PF	10% 50V
R925	1-216-131-11	METAL GLAZE 2.7M	5% 1/10W	C964	1-124-234-00	ELECT 22MF	20% 16V
R926	1-216-055-00	METAL GLAZE 1.8K	5% 1/10W	C965	1-124-261-00	ELECT 10MF	20% 50V
R927	1-216-061-00	METAL GLAZE 3.3K	5% 1/10W				
R928	1-216-051-00	METAL GLAZE 1.2K	5% 1/10W				
R929	1-216-047-00	METAL GLAZE 820	5% 1/10W				
R930	1-216-041-00	METAL GLAZE 470	5% 1/10W				

The components identified by mark **△** or dotted line with mark **△** are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque **△** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

PS-225

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C966	1-124-261-00	ELECT 10MF	20% 50V	<u>TRANSISTOR</u>			
C967	1-127-509-00	ELECT(SOLID) 3.3MF	20% 25V	Q935	8-729-805-43	TRANSISTOR 2SC3396	
C968	1-124-598-11	ELECT 22MF	20% 25V	Q936	8-729-805-67	TRANSISTOR 2SA1342	
C978	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	Q937	8-729-805-67	TRANSISTOR 2SA1342	
C984	1-124-570-11	ELECT 220MF	20% 16V	Q938	8-729-805-43	TRANSISTOR 2SC3396	
C985	1-163-019-00	CERAMIC CHIP 0.0068MF	10% 50V	Q939	8-729-805-67	TRANSISTOR 2SA1342	
C988	1-164-161-11	CERAMIC CHIP 0.0022MF	50V	Q940	8-729-162-13	TRANSISTOR 2SC1621	
C989	1-164-161-11	CERAMIC CHIP 0.0022MF	50V	Q941	8-729-105-29	TRANSISTOR 2SB1385	
C990	1-164-161-11	CERAMIC CHIP 0.0022MF	50V	Q942	8-729-805-25	TRANSISTOR 2SB1121	
C991	1-163-809-11	CERAMIC CHIP 0.047MF	10% 25V	Q943	8-729-805-67	TRANSISTOR 2SA1342	
<u>CONNECTOR</u>				Q944	8-729-805-43	TRANSISTOR 2SC3396	
CN901	1-506-481-11	PIN, CONNECTOR 2P		Q945	8-729-216-22	TRANSISTOR 2SA1162	
<u>DIODE</u>				Q946	8-729-216-22	TRANSISTOR 2SA1162	
D935	8-719-106-71	DIODE RD12M-B2		Q947	8-729-140-55	TRANSISTOR 2SK739	
D936	8-719-800-76	DIODE 1SS226		Q952	8-729-901-04	TRANSISTOR DTA114EK	
D937	8-719-800-76	DIODE 1SS226		Q953	8-729-805-45	TRANSISTOR 2SC3395	
D938	8-719-510-11	DIODE D1FS4		<u>RESISTOR</u>			
D939	8-719-801-48	DIODE 1SS193		R935	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
D940	8-719-801-48	DIODE 1SS193		R936	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
D941	8-719-802-36	DIODE 1SS250		R937	1-216-073-00	METAL GLAZE 10K 5%	1/10W
D942	8-719-801-48	DIODE 1SS193		R938	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
D943	8-719-801-48	DIODE 1SS193		R939	1-216-099-00	METAL GLAZE 120K 5%	1/10W
<u>FUSE</u>				R940	1-216-049-00	METAL GLAZE 1K 5%	1/10W
F901	1-532-778-21	FUSE, MICRO (SECONDARY) (1.6A 125V)		R941	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
F902	1-532-593-00	FUSE, GLASS TUBE (1.6A 125V)		R942	1-216-748-11	METAL GLAZE 39K 5%	1/10W
F903	1-532-778-21	FUSE, MICRO (SECONDARY) (1.6A 125V)		R943	1-216-033-00	METAL GLAZE 220 5%	1/10W
<u>IC</u>				R944	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
IC935	8-759-937-36	IC TL1451ACNS		R945	1-216-027-00	METAL GLAZE 120 5%	1/10W
<u>JACK</u>				R946	1-216-073-00	METAL GLAZE 10K 5%	1/10W
J901	1-537-241-11	TERMINAL BOARD (BATTERY)		R947	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
<u>COIL</u>				R948	1-216-081-00	METAL GLAZE 22K 5%	1/10W
L935	1-410-690-11	COIL, CHOKE 22UH		R949	1-216-049-00	METAL GLAZE 1K 5%	1/10W
L937	1-421-918-11	COIL, CHOKE 10UH		R950	1-216-037-00	METAL GLAZE 330 5%	1/10W
L938	1-410-626-11	COIL, CHOKE 47UH		R951	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
L939	1-410-626-11	COIL, CHOKE 47UH		R953	1-216-099-00	METAL GLAZE 120K 5%	1/10W
L940	1-410-828-31	INDUCTOR 47UH		R954	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
L942	1-410-626-11	COIL, CHOKE 47UH		R955	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
L944	1-410-385-11	INDUCTOR CHIP 22UH		R956	1-216-073-00	METAL GLAZE 10K 5%	1/10W
L946	1-421-918-11	COIL, CHOKE 10UH		R957	1-216-049-00	METAL GLAZE 1K 5%	1/10W
L951	1-410-658-31	INDUCTOR CHIP 220UH		R958	1-216-035-00	METAL GLAZE 270 5%	1/10W
L952	1-412-026-11	INDUCTOR CHIP 1UH		R959	1-216-049-00	METAL GLAZE 1K 5%	1/10W
L953	1-412-026-11	INDUCTOR CHIP 1UH		R960	1-216-001-00	METAL GLAZE 10 5%	1/10W
L954	1-412-026-11	INDUCTOR CHIP 1UH		R961	1-216-085-00	METAL GLAZE 33K 5%	1/10W
L955	1-412-026-11	INDUCTOR CHIP 1UH		R962	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
L956	1-412-026-11	INDUCTOR CHIP 1UH		R975	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
L957	1-412-026-11	INDUCTOR CHIP 1UH		R978	1-216-089-00	METAL GLAZE 47K 5%	1/10W
				R985	1-216-073-00	METAL GLAZE 10K 5%	1/10W
				R986	1-216-081-00	METAL GLAZE 22K 5%	1/10W
				R987	1-216-073-00	METAL GLAZE 10K 5%	1/10W
				R990	1-216-121-00	METAL GLAZE 1M 5%	1/10W

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
<u>VARIABLE RESISTOR</u>				<u>COIL</u>			
RV936	1-230-867-11	RES, ADJ, METAL GLAZE 1K		L601	1-410-393-11	INDUCTOR CHIP 100UH	
RV937	1-230-866-11	RES, ADJ, METAL GLAZE 470		<u>TRANSISTOR</u>			
RV938	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K		Q601	8-765-420-02	TRANSISTOR 2SK300-3	
<u>TRANSFORMER</u>				Q602	8-729-100-66	TRANSISTOR 2SC1623	
T936	1-449-454-11	TRANSFORMER, CONVERTER		Q603	8-729-100-66	TRANSISTOR 2SC1623	
<u>CONNECTOR</u>				Q604	8-729-100-66	TRANSISTOR 2SC1623	
W901	1-564-610-11	CONNECTOR, BOARD TO BOARD		Q605	8-729-100-66	TRANSISTOR 2SC1623	
W902	1-564-610-11	CONNECTOR, BOARD TO BOARD		Q606	8-729-216-22	TRANSISTOR 2SA1162	
*****				Q607	8-729-104-25	TRANSISTOR 2SB804-AV	
*A-7061-738-A CD-17 BOARD, COMPLETE (Ref.No 1,000 Series)				Q608	8-729-103-72	TRANSISTOR 2SD1005-BV	
*****				Q609	8-729-216-22	TRANSISTOR 2SA1162	
				Q610	8-729-100-66	TRANSISTOR 2SC1623	
				<u>RESISTOR</u>			
<u>CAPACITOR</u>				R601	1-216-025-00	METAL GLAZE 100 5%	1/10W
C601	1-126-193-11	ELECT CHIP 1MF 20%	50V	R602	1-216-081-00	METAL GLAZE 22K 5%	1/10W
C602	1-126-208-11	ELECT CHIP 47MF 20%	4V	R603	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
C603	1-126-196-11	ELECT CHIP 3.3MF 20%	50V	R604	1-216-075-00	METAL GLAZE 12K 5%	1/10W
C604	1-126-196-11	ELECT CHIP 3.3MF 20%	50V	R605	1-216-079-00	METAL GLAZE 18K 5%	1/10W
C606	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V	R606	1-216-041-00	METAL GLAZE 470 5%	1/10W
C607	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V	R607	1-216-121-00	METAL GLAZE 1M 5%	1/10W
C608	1-164-005-11	CERAMIC CHIP 0.47MF 25V		R608	1-216-045-00	METAL GLAZE 680 5%	1/10W
C610	1-135-145-11	TANTAL. CHIP 0.47MF 20%	25V	R609	1-216-091-00	METAL GLAZE 56K 5%	1/10W
C611	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V	R610	1-216-077-00	METAL GLAZE 15K 5%	1/10W
C612	1-163-016-00	CERAMIC CHIP 0.0039MF 10%	50V	R611	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C613	1-164-232-11	CERAMIC CHIP 0.01MF 10%	50V	R612	1-216-095-00	METAL GLAZE 82K 5%	1/10W
C614	1-164-232-11	CERAMIC CHIP 0.01MF 10%	50V	R613	1-216-095-00	METAL GLAZE 82K 5%	1/10W
C615	1-163-009-11	CERAMIC CHIP 0.001MF 10%	50V	R614	1-216-077-00	METAL GLAZE 15K 5%	1/10W
C617	1-163-023-00	CERAMIC CHIP 0.015MF 10%	50V	R615	1-216-109-00	METAL GLAZE 330K 5%	1/10W
C618	1-163-036-00	CERAMIC CHIP 0.068MF 50V		R616	1-216-005-00	METAL GLAZE 15 5%	1/10W
C619	1-126-405-11	ELECT CHIP 10MF 20%	50V	R617	1-216-005-00	METAL GLAZE 15 5%	1/10W
C620	1-163-036-00	CERAMIC CHIP 0.068MF 50V		R618	1-216-081-00	METAL GLAZE 22K 5%	1/10W
C621	1-164-161-11	CERAMIC CHIP 0.0022MF 10%	50V	R619	1-216-085-00	METAL GLAZE 33K 5%	1/10W
C630	1-162-638-11	CERAMIC CHIP 1MF 16V		R620	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C631	1-163-117-00	CERAMIC CHIP 100PF 5%	50V	R621	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C632	1-163-117-00	CERAMIC CHIP 100PF 5%	50V	R622	1-216-073-00	METAL GLAZE 10K 5%	1/10W
<u>CONNECTOR</u>				R630	1-216-081-00	METAL GLAZE 22K 5%	1/10W
CN601	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P		R631	1-216-073-00	METAL GLAZE 10K 5%	1/10W
CN602	*1-566-196-11	PIN, CONNECTOR (PC BOARD) 3P		R632	1-216-095-00	METAL GLAZE 82K 5%	1/10W
CN603	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P		R633	1-216-089-00	METAL GLAZE 47K 5%	1/10W
CN604	*1-566-198-11	PIN, CONNECTOR (PC BOARD) 5P		R634	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W
CN605	*1-566-201-11	PIN, CONNECTOR (PC BOARD) 8P		R635	1-216-081-00	METAL GLAZE 22K 5%	1/10W
				R636	1-216-295-00	METAL GLAZE 0 5%	1/10W
<u>DIODE</u>				<u>CONNECTOR</u>			
D601	8-719-400-18	DIODE MA152WK		W601	1-575-151-11	CABLE, FLAT (1.0MM PITCH)	
D602	8-719-104-34	DIODE 1S2836		W603	1-575-063-11	CABLE, FLAT (1.0MM PITCH) 14P	
D603	8-719-400-18	DIODE MA152WK		*****			
D604	8-719-400-18	DIODE MA152WK		*****			

CK-19

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
*A-7061-739-A CK-19 BOARD, COMPLETE (Ref.No 4,000 Series) *****				RESISTOR			
	3-712-410-01	HOLDER, RS		R651	1-216-097-00	METAL GLAZE 100K 5%	1/10W
<u>CAPACITOR</u>				R652	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C651	1-163-093-00	CERAMIC CHIP 10PF	5% 50V	R653	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C652	1-163-038-00	CERAMIC CHIP 0.1MF	25V	R654	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C653	1-163-038-00	CERAMIC CHIP 0.1MF	25V	R655	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C654	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	R656	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C655	1-135-149-21	TANTAL. CHIP 2.2MF	20% 10V	R657	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C656	1-135-149-21	TANTAL. CHIP 2.2MF	20% 10V	R658	1-216-073-00	METAL GLAZE 10K 5%	1/10W
C657	1-135-157-21	TANTAL. CHIP 10MF	20% 6.3V	R659	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C658	1-163-038-00	CERAMIC CHIP 0.1MF	25V	R660	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C659	1-162-638-11	CERAMIC CHIP 1MF	16V	R661	1-216-097-00	METAL GLAZE 100K 5%	1/10W
C660	1-163-989-11	CERAMIC CHIP 0.033MF	10% 25V	R662	1-216-097-00	METAL GLAZE 100K 5%	1/10W
<u>TRIMMER</u>				R663	1-216-089-00	METAL GLAZE 47K 5%	1/10W
CV651	1-141-331-11	CAP, VAR, TRIMMER (CHIP) 30PF		R664	1-216-093-00	METAL GLAZE 68K 5%	1/10W
<u>DIODE</u>				R665	1-216-085-00	METAL GLAZE 33K 5%	1/10W
D651	8-719-938-72	DIODE SB01-05CP		R666	1-216-025-00	METAL GLAZE 100 5%	1/10W
D652	8-719-100-05	DIODE 1S2838		R667	1-216-129-00	METAL GLAZE 2.2M 5%	1/10W
D653	8-719-100-05	DIODE 1S2838		R668	1-216-097-00	METAL GLAZE 100K 5%	1/10W
D654	8-719-100-05	DIODE 1S2838		R669	1-216-105-00	METAL GLAZE 220K 5%	1/10W
D657	8-719-100-05	DIODE 1S2838		R670	1-216-246-00	METAL GLAZE 100K 5%	1/8W
D658	8-719-100-05	DIODE 1S2838		R671	1-216-109-00	METAL GLAZE 330K 5%	1/10W
D660	8-719-939-11	GP2509-B		R672	1-216-097-00	METAL GLAZE 100K 5%	1/10W
<u>IC</u>				R673	1-216-097-00	METAL GLAZE 100K 5%	1/10W
IC651	8-759-147-08	IC UPD7508BGB-512		R674	1-216-097-00	METAL GLAZE 100K 5%	1/10W
<u>COIL</u>				R675	1-216-097-00	METAL GLAZE 100K 5%	1/10W
L651	1-410-391-11	INDUCTOR CHIP 68UH		R676	1-216-103-00	METAL GLAZE 180K 5%	1/10W
<u>TRANSISTOR</u>				R677	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q651	8-729-901-03	TRANSISTOR DTC144WK		R678	1-218-167-11	METAL GLAZE 330K 1%	1/10W
Q652	8-729-216-22	TRANSISTOR 2SA1162		R679	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q653	8-729-901-03	TRANSISTOR DTC144WK		R680	1-218-167-11	METAL GLAZE 330K 1%	1/10W
Q654	8-729-220-93	TRANSISTOR 2SK209G-TE85L		R681	1-216-336-11	METAL GLAZE 47K 1%	1/10W
Q655	8-729-216-22	TRANSISTOR 2SA1162		R682	1-216-097-00	METAL GLAZE 100K 5%	1/10W
Q656	8-729-216-22	TRANSISTOR 2SA1162		R683	1-216-109-00	METAL GLAZE 330K 5%	1/10W
Q657	8-729-216-22	TRANSISTOR 2SA1162		R684	1-216-097-00	METAL GLAZE 100K 5%	1/10W
Q658	8-729-100-66	TRANSISTOR 2SC1623		R685	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q659	8-729-100-66	TRANSISTOR 2SC1623		R686	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q660	8-729-216-22	TRANSISTOR 2SA1162		R687	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q661	8-729-216-22	TRANSISTOR 2SA1162		R688	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q662	8-729-902-XX	TRANSISTOR DTC114TK		R689	1-216-097-00	METAL GLAZE 100K 5%	1/10W
Q663	8-729-902-XX	TRANSISTOR DTC114TK		R690	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q664	8-729-216-22	TRANSISTOR 2SA1162		R691	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q665	8-729-901-01	TRANSISTOR DTC144EK		R692	1-216-097-00	METAL GLAZE 100K 5%	1/10W
				R693	1-216-049-00	METAL GLAZE 1K 5%	1/10W
				R694	1-216-025-00	METAL GLAZE 100 5%	1/10W
				R695	1-216-097-00	METAL GLAZE 100K 5%	1/10W
				R697	1-216-296-00	METAL GLAZE 0 5%	1/8W
				R698	1-216-296-00	METAL GLAZE 0 5%	1/8W
				R699	1-216-296-00	METAL GLAZE 0 5%	1/8W
				R700	1-216-295-00	METAL GLAZE 0 5%	1/10W
				R701	1-216-295-00	METAL GLAZE 0 5%	1/10W
				R702	1-216-296-00	METAL GLAZE 0 5%	1/8W

When indicating parts by reference number, please include the board name.

CK-19**DK-4****MA-37****VK-3**

Ref.No	Part No.	Description	Remark
R703	1-216-296-00	METAL GLAZE 0 5% 1/8W	
R704	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R705	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R706	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R707	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R708	1-216-296-00	METAL GLAZE 0 5% 1/8W	
R709	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R710	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R712	1-216-295-00	METAL GLAZE 0 5% 1/10W	

VARIABLE RESISTOR

RV651 1-230-874-11 RES, ADJ, METAL GLAZE 100K

SWITCH

S652 1-571-787-11 SWITCH, TACTILE (SHUTTER SPEED)
 S653 1-571-787-11 SWITCH, TACTILE (BACK LIGHT)
 S654 1-571-787-11 SWITCH, TACTILE (WHITE BAL)
 S655 1-571-787-11 SWITCH, TACTILE (FOCUS)
 S658 1-571-787-11 SWITCH, TACTILE (DATE/ +)

S659 1-571-787-11 SWITCH, TACTILE (TIME/SET)

CRYSTAL

X651 1-527-997-21 VIBRATOR, CRYSTAL (32.768KHz)

*1-631-825-11 DK-4 BOARD (Ref.No 5,000 Series)

DIODE

D691 8-719-100-05 DIODE 1S2838
 D692 8-719-100-05 DIODE 1S2838

SWITCH

S691 1-571-787-11 SWITCH, TACTILE (ES CUE)
 S692 1-571-787-11 SWITCH, TACTILE (ES REV)
 S693 1-571-787-11 SWITCH, TACTILE (COUNTER RESET)
 S694 1-571-787-11 SWITCH, TACTILE (ZERO MEMO)

CONNECTOR

W652 1-575-062-11 CABLE, FLAT (1.0MM PITCH) 6P

*A-7061-741-A MA-37 BOARD, COMPLETE (Ref.No 9,000 Series)

CAPACITOR

C451	1-126-154-11	ELECT 47MF	20%	6.3V
C452	1-162-638-11	CERAMIC CHIP 1MF		16V
C453	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V
C455	1-163-137-00	CERAMIC CHIP 680PF	5%	50V
C456	1-163-077-00	CERAMIC CHIP 0.1MF	10%	25V

Ref.No	Part No.	Description	Remark
C457	1-163-063-00	CERAMIC CHIP 0.022MF	10% 50V
C458	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C459	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C460	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C464	1-162-638-11	CERAMIC CHIP 1MF	16V
C465	1-163-809-11	CERAMIC CHIP 0.047MF	10% 25V
C466	1-124-225-00	ELECT 100MF	20% 6.3V
C468	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C471	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C474	1-162-638-11	CERAMIC CHIP 1MF	16V

CONNECTOR

CN451 1-565-877-11 PIN, CONNECTOR (PC BOARD) 5P
 CN452 *1-566-182-11 PIN, CONNECTOR (PC BOARD) 3P

IC

IC451 8-759-820-51 IC LA7293

JACK

J451 1-507-921-00 JACK (MIC)
 J452 1-563-454-11 JACK, MINIATURE (DC OUT)

TRANSISTOR

Q451 8-729-100-66 TRANSISTOR 2SC1623

RESISTOR

R451	1-216-063-00	METAL GLAZE 3.9K	5%	1/10W
R452	1-216-748-11	METAL GLAZE 39K	5%	1/10W
R453	1-216-089-00	METAL GLAZE 47K	5%	1/10W
R455	1-216-073-00	METAL GLAZE 10K	5%	1/10W
R456	1-216-069-00	METAL GLAZE 6.8K	5%	1/10W
R459	1-216-001-00	METAL GLAZE 10	5%	1/10W
R462	1-216-073-00	METAL GLAZE 10K	5%	1/10W
R465	1-216-079-00	METAL GLAZE 18K	5%	1/10W
R467	1-216-059-00	METAL GLAZE 2.7K	5%	1/10W

SWITCH

S451 1-570-910-21 SWITCH, TACTIL (REFLOW TYPE)
 (REC START/STOP)

*1-631-828-11 VK-3 BOARD (Ref.No 9,000 Series)

CONNECTOR

CN508 *1-566-182-11 PIN, CONNECTOR (PC BOARD) 3P

DIODE

D501 8-719-100-05 DIODE 1S2838
 D502 8-719-100-03 DIODE 1S2836
 D503 8-719-100-03 DIODE 1S2836
 D504 8-719-801-41 DIODE 1SS196

When indicating parts by reference number, please include the board name.

VK-3 CC-26 CV-8

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
<u>TRANSISTOR</u>				<u>TRANSISTOR</u>			
Q501	8-729-805-39	TRANSISTOR 2SC3898		R006	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
Q502	8-729-805-39	TRANSISTOR 2SC3898		R007	1-216-174-00	METAL GLAZE 100 5% 1/8W	
<u>SWITCH</u>				R008	1-216-041-00	METAL GLAZE 470 5% 1/10W	
S501	1-571-101-12	SWITCH, SLIDE (POWER CAM/OFF)		R009	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
S502	1-571-787-11	SWITCH, TACTILE ( REW)		R010	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
S503	1-571-787-11	SWITCH, TACTILE ( PB)		R011	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
S504	1-571-787-11	SWITCH, TACTILE ( FF)		R012	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
S505	1-571-787-11	SWITCH, TACTILE ( STOP)		R013	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
S506	1-571-787-11	SWITCH, TACTILE ( PAUSE)		R014	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
S507	1-571-102-21	SWITCH, SLIDE (REC)		R015	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
S508	1-571-102-11	SWITCH, SLIDE (EJECT)		R016	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
S509	1-571-787-11	SWITCH, TACTILE (DATA SCREEN)		<u>CONNECTOR</u>			
S510	1-553-977-00	SWITCH, SLIDE (EDIT)		W501	1-574-458-12	CABLE, FLAT (1.0MM PITCH) 13P	
<u>CONNECTOR</u>				*****			
W507	1-574-452-12	CABLE, FLAT (1.0MM PITCH) 12P		*A-7061-832-A	CV-8 BOARD, COMPLETE (Ref.No 2,000 Series)		
*****				A-7068-128-A	MX-7 BOARD, COMPLETE (HIC)		
*A-7061-744-A	CC-26 BOARD, COMPLETE (Ref.No 7,000 Series)			A-7068-150-A	DT-73 BOARD, COMPLETE (HIC)		
<u>CAPACITOR</u>				<u>CAPACITOR</u>			
C001	1-162-638-11	CERAMIC CHIP 1MF 16V		C201	1-163-021-91	CERAMIC CHIP 0.01MF 10% 50V	
C002	1-162-638-11	CERAMIC CHIP 1MF 16V		C202	1-124-779-00	ELECT CHIP 10MF 20% 16V	
C003	1-163-038-00	CERAMIC CHIP 0.1MF 25V		C203	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
<u>CONNECTOR</u>				C204	1-124-779-00	ELECT CHIP 10MF 20% 16V	
CN001	1-566-529-11	CONNECTOR, FPC (ZIF) 13P		C205	1-162-638-11	CERAMIC CHIP 1MF 16V	
CN002	1-566-527-11	CONNECTOR, FPC (ZIF) 11P		C206	1-124-779-00	ELECT CHIP 10MF 20% 16V	
<u>DIODE</u>				C209	1-126-205-11	ELECT CHIP 47MF 20% 6.3V	
D001	8-719-801-41	DIODE 1SS196		C210	1-162-638-11	CERAMIC CHIP 1MF 16V	
D002	8-719-801-41	DIODE 1SS196		C211	1-163-809-11	CERAMIC CHIP 0.047MF 10% 25V	
D003	8-719-801-41	DIODE 1SS196		C212	1-162-638-11	CERAMIC CHIP 1MF 16V	
<u>IC</u>				C213	1-124-779-00	ELECT CHIP 10MF 20% 16V	
IC001	8-759-100-93	IC UPC393G2		C214	1-126-246-11	ELECT CHIP 220MF 20% 4V	
<u>TRANSISTOR</u>				C215	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
Q002	8-729-805-39	TRANSISTOR 2SC3898		C216	1-124-779-00	ELECT CHIP 10MF 20% 16V	
Q004	8-729-805-39	TRANSISTOR 2SC3898		C217	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
Q005	8-729-805-39	TRANSISTOR 2SC3898		C218	1-162-638-11	CERAMIC CHIP 1MF 16V	
Q006	8-729-805-41	TRANSISTOR 2SC3398		C219	1-126-195-11	ELECT CHIP 2.2MF 20% 50V	
<u>RESISTOR</u>				C220	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
R001	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W		C221	1-163-117-00	CERAMIC CHIP 100PF 5% 50V	
R002	1-216-109-00	METAL GLAZE 330K 5% 1/10W		C224	1-126-193-11	ELECT CHIP 1MF 20% 50V	
R003	1-216-109-00	METAL GLAZE 330K 5% 1/10W		C225	1-126-195-11	ELECT CHIP 2.2MF 20% 50V	
R004	1-216-097-00	METAL GLAZE 100K 5% 1/10W		C226	1-126-198-11	ELECT CHIP 4.7MF 20% 35V	
R005	1-216-097-00	METAL GLAZE 100K 5% 1/10W		C227	1-164-232-11	CERAMIC CHIP 0.01MF 10% 50V	
				C228	1-126-196-11	ELECT CHIP 3.3MF 20% 50V	
				C229	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
				C230	1-126-193-11	ELECT CHIP 1MF 20% 50V	
				C231	1-164-232-11	CERAMIC CHIP 0.01MF 50V	
				C232	1-126-196-11	ELECT CHIP 3.3MF 20% 50V	
				C233	1-124-779-00	ELECT CHIP 10MF 20% 16V	

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C234	1-124-779-00	ELECT CHIP 10MF	20% 16V	C297	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C235	1-124-779-00	ELECT CHIP 10MF	20% 16V	C298	1-163-986-00	CERAMIC CHIP 0.027MF	10% 25V
C236	1-126-193-11	ELECT CHIP 1MF	20% 50V	C300	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C237	1-126-193-11	ELECT CHIP 1MF	20% 50V	C301	1-163-105-00	CERAMIC CHIP 33PF	5% 50V
C238	1-126-196-11	ELECT CHIP 3.3MF	20% 50V	C302	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C239	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C304	1-163-127-00	CERAMIC CHIP 270PF	5% 50V
C240	1-126-193-11	ELECT CHIP 1MF	20% 50V	C305	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C241	1-126-193-11	ELECT CHIP 1MF	20% 50V	C306	1-124-778-00	ELECT CHIP 22MF	20% 6.3V
C242	1-126-193-11	ELECT CHIP 1MF	20% 50V	C307	1-164-232-11	CERAMIC CHIP 0.01MF	5% 50V
C243	1-126-193-11	ELECT CHIP 1MF	20% 50V	C308	1-163-107-00	CERAMIC CHIP 39PF	5% 50V
C244	1-126-196-11	ELECT CHIP 3.3MF	20% 50V	C309	1-163-097-00	CERAMIC CHIP 15PF	5% 50V
C245	1-126-100-11	ELECT CHIP 10MF	20% 6.3V	C310	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C246	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C311	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C247	1-124-779-00	ELECT CHIP 10MF	20% 16V	C312	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
C248	1-124-779-00	ELECT CHIP 10MF	20% 16V	C313	1-163-116-00	CERAMIC CHIP 91PF	5% 50V
C249	1-124-779-00	ELECT CHIP 10MF	20% 16V	C314	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C250	1-124-779-00	ELECT CHIP 10MF	20% 16V	C315	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C251	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V	C316	1-163-115-00	CERAMIC CHIP 82PF	5% 50V
C252	1-124-779-00	ELECT CHIP 10MF	20% 16V	C317	1-163-015-00	CERAMIC CHIP 0.0033MF	10% 50V
C253	1-164-232-11	CERAMIC CHIP 0.01MF	50V	C327	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C254	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C333	1-126-193-11	ELECT CHIP 1MF	20% 50V
C255	1-124-779-00	ELECT CHIP 10MF	20% 16V	C350	1-163-121-00	CERAMIC CHIP 150PF	5% 50V
C256	1-124-779-00	ELECT CHIP 10MF	20% 16V	C351	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C257	1-124-779-00	ELECT CHIP 10MF	20% 16V	C352	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C258	1-163-133-00	CERAMIC CHIP 470PF	5% 50V	C353	1-163-127-00	CERAMIC CHIP 270PF	5% 50V
C259	1-163-131-00	CERAMIC CHIP 390PF	5% 50V	C355	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C260	1-124-779-00	ELECT CHIP 10MF	20% 16V	C356	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C261	1-163-117-00	CERAMIC CHIP 100PF	5% 50V	C357	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C262	1-163-118-00	CERAMIC CHIP 110PF	5% 50V	C360	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C264	1-124-779-00	ELECT CHIP 10MF	20% 16V	C362	1-163-099-00	CERAMIC CHIP 18PF	5% 50V
C265	1-124-779-00	ELECT CHIP 10MF	20% 16V	C363	1-163-133-00	CERAMIC CHIP 470PF	5% 50V
C267	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	C364	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C268	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C365	1-163-093-00	CERAMIC CHIP 10PF	5% 50V
C269	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C367	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V
C270	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C368	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C271	1-163-095-00	CERAMIC CHIP 12PF	5% 50V	C369	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C273	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C370	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C274	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C371	1-164-004-11	CERAMIC CHIP 0.1MF	10% 25V
C276	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C374	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C277	1-162-638-11	CERAMIC CHIP 1MF	16V	C501	1-163-105-00	CERAMIC CHIP 33PF	5% 50V
C278	1-163-129-00	CERAMIC CHIP 330PF	5% 50V	C502	1-163-117-00	CERAMIC CHIP 100PF	5% 50V
C279	1-163-113-00	CERAMIC CHIP 68PF	5% 50V	C503	1-163-109-00	CERAMIC CHIP 47PF	5% 50V
C280	1-164-232-11	CERAMIC CHIP 0.01MF	50V	C506	1-164-232-11	CERAMIC CHIP 0.01MF	50V
C281	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C507	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C287	1-126-100-11	ELECT CHIP 10MF	20% 6.3V	C508	1-124-779-00	ELECT CHIP 10MF	20% 16V
C288	1-164-232-11	CERAMIC CHIP 0.01MF	50V	C509	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C289	1-124-779-00	ELECT CHIP 10MF	20% 16V	C510	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C291	1-163-033-00	CERAMIC CHIP 0.022MF	50V	C511	1-163-141-00	CERAMIC CHIP 0.001MF	5% 50V
C292	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C512	1-163-123-00	CERAMIC CHIP 180PF	5% 50V
C293	1-163-095-00	CERAMIC CHIP 12PF	5% 50V	C513	1-163-093-00	CERAMIC CHIP 10PF	5% 50V
C294	1-163-033-00	CERAMIC CHIP 0.022MF	50V	C514	1-163-005-11	CERAMIC CHIP 470PF	10% 50V
C295	1-163-101-00	CERAMIC CHIP 22PF	5% 50V	C601	1-135-145-11	TANTAL. CHIP 0.47MF	20% 25V
C296	1-163-105-00	CERAMIC CHIP 33PF	5% 50V	C602	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V

When indicating parts by reference number, please include the board name.

CV-8

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C603	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C675	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C604	1-162-638-11	CERAMIC CHIP 1MF	16V	C676	1-163-101-00	CERAMIC CHIP 22PF	5% 50V
C605	1-162-638-11	CERAMIC CHIP 1MF	16V	C677	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C606	1-163-100-00	CERAMIC CHIP 20PF	5% 50V	C679	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C607	1-163-118-00	CERAMIC CHIP 110PF	5% 50V	C690	1-164-005-11	CERAMIC CHIP 0.47MF	25V
C608	1-163-114-00	CERAMIC CHIP 75PF	5% 50V	C691	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C609	1-163-100-00	CERAMIC CHIP 20PF	5% 50V	C692	1-135-091-00	TANTAL. CHIP 1MF	20% 16V
C610	1-163-118-00	CERAMIC CHIP 110PF	5% 50V	C693	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C611	1-163-114-00	CERAMIC CHIP 75PF	5% 50V	C694	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C612	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C695	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C613	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C696	1-163-125-00	CERAMIC CHIP 220PF	5% 50V
C614	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C697	1-163-111-00	CERAMIC CHIP 56PF	5% 50V
C615	1-163-097-00	CERAMIC CHIP 15PF	5% 50V	C699	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C616	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C700	1-162-638-11	CERAMIC CHIP 1MF	16V
C617	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C701	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C618	1-163-093-00	CERAMIC CHIP 10PF	5% 50V	C702	1-162-638-11	CERAMIC CHIP 1MF	16V
C619	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C703	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C621	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C704	1-124-566-11	ELECT 120MF	20% 6.3V
C622	1-163-095-00	CERAMIC CHIP 12PF	5% 50V	C705	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C623	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C706	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C624	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C707	1-135-145-11	TANTAL. CHIP 0.47MF	20% 25V
C626	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C708	1-164-232-11	CERAMIC CHIP 0.01MF	50V
C627	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	C709	1-163-093-00	CERAMIC CHIP 10PF	5% 50V
C628	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	C710	1-164-005-11	CERAMIC CHIP 0.47MF	25V
C629	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	C712	1-126-205-11	ELECT CHIP 47MF	20% 6.3V
C631	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C713	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C632	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C714	1-164-232-11	CERAMIC CHIP 0.01MF	50V
C636	1-126-205-11	ELECT CHIP 47MF	20% 6.3V	C715	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V
C637	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C716	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C638	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C718	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C639	1-126-199-11	ELECT CHIP 6.8MF	20% 35V	C719	1-135-072-21	TANTAL. CHIP 0.22MF	20% 35V
C640	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C721	1-124-779-00	ELECT CHIP 10MF	20% 16V
C641	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C722	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C642	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C723	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C647	1-124-778-00	ELECT CHIP 22MF	20% 6.3V	C724	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C648	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C725	1-162-638-11	CERAMIC CHIP 1MF	16V
C650	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C726	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C651	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C727	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C652	1-163-109-00	CERAMIC CHIP 47PF	5% 50V	C729	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C653	1-163-038-00	CERAMIC CHIP 0.1MF	25V	C730	1-162-638-11	CERAMIC CHIP 1MF	16V
C654	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C731	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C655	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	C733	1-126-196-11	ELECT CHIP 3.3MF	20% 50V
C656	1-163-101-00	CERAMIC CHIP 22PF	5% 50V	C735	1-126-206-11	ELECT CHIP 100MF	20% 6.3V
C658	1-162-638-11	CERAMIC CHIP 1MF	16V	C736	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C660	1-162-638-11	CERAMIC CHIP 1MF	16V	C741	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V
C661	1-163-809-11	CERAMIC CHIP 0.047MF	10% 25V	C798	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C662	1-162-638-11	CERAMIC CHIP 1MF	16V	C799	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C665	1-162-638-11	CERAMIC CHIP 1MF	16V	C801	1-124-779-00	ELECT CHIP 10MF	20% 16V
C666	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C802	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C669	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C803	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C672	1-163-131-00	CERAMIC CHIP 390PF	5% 50V	C804	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V
C673	1-163-131-00	CERAMIC CHIP 390PF	5% 50V	C805	1-163-038-00	CERAMIC CHIP 0.1MF	25V
C674	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	C806	1-163-038-00	CERAMIC CHIP 0.1MF	25V

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C807	1-164-232-11	CERAMIC CHIP 0.01MF	50V	<u>DIODE</u>			
C808	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D210	8-719-800-76	DIODE 1SS226	
C809	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	D211	8-719-800-76	DIODE 1SS226	
C810	1-163-119-00	CERAMIC CHIP 120PF	5% 50V	D213	8-719-100-05	DIODE 1S2838	
C811	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	D214	8-719-940-45	DIODE DWA010	
C812	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	D215	8-719-940-45	DIODE DWA010	
C813	1-162-638-11	CERAMIC CHIP 1MF	16V	D501	8-713-220-00	DIODE 1T32-2	
C814	1-164-232-11	CERAMIC CHIP 0.01MF	50V	D601	8-719-100-03	DIODE 1S2836	
C815	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D602	8-719-100-05	DIODE 1S2838	
C817	1-163-038-00	CERAMIC CHIP 0.1MF	25V	D604	8-719-100-05	DIODE 1S2838	
C818	1-162-638-11	CERAMIC CHIP 1MF	16V	D606	8-719-100-05	DIODE 1S2838	
C819	1-164-232-11	CERAMIC CHIP 0.01MF	50V	D804	8-719-100-05	DIODE 1S2838	
C820	1-163-038-00	CERAMIC CHIP 0.1MF	25V	<u>FILTER</u>			
C821	1-163-038-00	CERAMIC CHIP 0.1MF	25V	FL201	1-409-439-11	FILTER, TRAP	
C822	1-164-232-11	CERAMIC CHIP 0.01MF	50V	FL202	1-236-146-11	FILTER, BAND PASS	
C824	1-162-638-11	CERAMIC CHIP 1MF	16V	FL203	1-567-727-11	FILTER, CERAMIC	
C825	1-162-637-11	CERAMIC CHIP 0.47MF	16V	FL601	1-236-189-11	FILTER, LOW PASS	
C826	1-162-637-11	CERAMIC CHIP 0.47MF	16V	FL602	1-236-374-11	LPF, YDL	
C827	1-164-232-11	CERAMIC CHIP 0.01MF	50V	FL603	1-236-375-11	LPF, YDL	
C828	1-164-232-11	CERAMIC CHIP 0.01MF	50V	FL604	1-236-192-11	FILTER, LOW PASS	
C829	1-163-125-00	CERAMIC CHIP 220PF	5% 50V	FL617	1-415-695-11	DL, LC	
C830	1-163-038-00	CERAMIC CHIP 0.1MF	25V	FL801	1-236-209-11	FILTER, LOW PASS	
C832	1-164-005-11	CERAMIC CHIP 0.47MF	25V	<u>IC</u>			
C835	1-163-033-00	CERAMIC CHIP 0.022MF	50V	IC201	8-752-033-40	IC CXA1201Q	
C836	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	IC202	8-752-323-46	IC CXL1501M	
C837	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	IC203	8-752-034-40	IC CXA1200BQ	
C838	1-163-093-00	CERAMIC CHIP 10PF	5% 50V	IC501	8-759-140-26	IC UPD6145G-601	
C839	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V	IC502	8-759-970-80	IC MB673198U	
C840	1-164-161-11	CERAMIC CHIP 0.0022MF	10% 50V	IC601	8-759-031-48	IC MC68HC05N4-SC406656	
C841	1-163-033-00	CERAMIC CHIP 0.022MF	50V	IC602	8-759-932-54	IC BU4066BF	
C842	1-164-232-11	CERAMIC CHIP 0.01MF	50V	IC603	8-759-100-95	IC UPC324G2	
C843	1-124-779-00	ELECT CHIP 10MF	20% 16V	IC604	8-752-326-08	IC CXD1159Q	
C844	1-126-205-11	ELECT CHIP 47MF	20% 6.3V	IC605	8-752-034-21	IC CXA1339R	
C845	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	IC606	8-752-033-34	IC CXA1072R	
C846	1-163-038-00	CERAMIC CHIP 0.1MF	25V	IC608	8-759-946-00	IC MB88341PFV	
C848	1-163-038-00	CERAMIC CHIP 0.1MF	25V	IC609	8-759-946-00	IC MB88341PFV	
C849	1-164-005-11	CERAMIC CHIP 0.47MF	25V	IC610	8-759-937-56	IC S-8054ALB-LM-S	
<u>CONNECTOR</u>				IC801	8-752-326-18	IC CXD1204R	
CN202	*1-565-541-11	PIN, CONNECTOR (PC BOARD) 2P		IC802	8-759-031-85	IC MC68HC05C4FU	
CN501	1-568-165-11	CONNECTOR, FPC (1.0MM) (ZIF) 22P		IC803	8-759-971-93	IC MSM6219GS-VK	
CN502	1-568-165-11	CONNECTOR, FPC (1.0MM) (ZIF) 22P		IC804	8-759-946-00	IC MB88341PFV	
CN601	1-566-547-11	CONNECTOR, FPC (NON ZIF) 15P		IC805	8-759-030-35	IC MPC1725MR	
CN602	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P		IC806	8-759-100-94	IC UPC358G2	
CN801	1-566-530-11	CONNECTOR, FPC (ZIF) 14P		IC807	8-759-981-82	IC RC3414M	
CN802	1-568-207-11	CONNECTOR, FPC (ZIF) 23P		IC808	8-759-100-94	IC UPC358G2	
CN803	*1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P		IC810	8-759-231-23	IC TK10500M	
CN901	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P		<u>COIL</u>			
<u>TRIMMER</u>				L201	1-412-032-11	INDUCTOR CHIP 100UH	
CV501	1-141-331-11	CAP, VAR, TRIMMER (CHIP) 30P		L203	1-412-032-11	INDUCTOR CHIP 100UH	
CV502	1-141-331-11	CAP, VAR, TRIMMER (CHIP) 30P					

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
L204	1-412-031-11	INDUCTOR CHIP 47UH		Q215	8-729-100-66	TRANSISTOR 2SC1623	
L205	1-412-031-11	INDUCTOR CHIP 47UH		Q216	8-729-100-66	TRANSISTOR 2SC1623	
L206	1-410-388-21	INDUCTOR CHIP 39UH		Q217	8-729-216-22	TRANSISTOR 2SA1162	
L207	1-410-385-11	INDUCTOR CHIP 22UH		Q222	8-729-216-22	TRANSISTOR 2SA1162	
L208	1-412-029-11	INDUCTOR CHIP 10UH		Q223	8-729-805-45	TRANSISTOR 2SC3395	
L209	1-412-032-11	INDUCTOR CHIP 100UH		Q224	8-729-102-06	TRANSISTOR 2SC2223-F13	
L210	1-410-387-11	INDUCTOR CHIP 33UH		Q225	8-729-100-66	TRANSISTOR 2SC1623	
L211	1-410-656-11	INDUCTOR CHIP 150UH		Q226	8-729-901-06	TRANSISTOR DTA144EK	
L212	1-410-381-11	INDUCTOR CHIP 10UH		Q227	8-729-901-06	TRANSISTOR DTA144EK	
L214	1-408-797-11	INDUCTOR CHIP 470UH		Q228	8-729-100-66	TRANSISTOR 2SC1623	
L215	1-408-795-21	INDUCTOR CHIP 330UH		Q229	8-729-216-22	TRANSISTOR 2SA1162	
L216	1-408-795-21	INDUCTOR CHIP 330UH		Q230	8-729-122-63	TRANSISTOR 2SA1226	
L217	1-410-657-21	INDUCTOR CHIP 180UH		Q231	8-729-102-06	TRANSISTOR 2SC2223-F13	
L219	1-412-032-11	INDUCTOR CHIP 100UH		Q232	8-729-102-06	TRANSISTOR 2SC2223-F13	
L220	1-410-380-31	INDUCTOR CHIP 8.2UH		Q233	8-729-216-22	TRANSISTOR 2SA1162	
L221	1-408-795-21	INDUCTOR CHIP 330UH		Q235	8-729-100-66	TRANSISTOR 2SC1623	
L222	1-410-655-31	INDUCTOR CHIP 120UH		Q236	8-729-100-66	TRANSISTOR 2SC1623	
L223	1-410-393-11	INDUCTOR CHIP 100UH		Q241	8-729-216-22	TRANSISTOR 2SA1162	
L224	1-410-656-11	INDUCTOR CHIP 150UH		Q243	8-729-216-22	TRANSISTOR 2SA1162	
L227	1-410-389-11	INDUCTOR CHIP 47UH		Q244	8-729-805-45	TRANSISTOR 2SC3395	
L228	1-410-388-21	INDUCTOR CHIP 39UH		Q245	8-729-805-45	TRANSISTOR 2SC3395	
L229	1-410-392-11	INDUCTOR CHIP 82UH		Q250	8-729-100-66	TRANSISTOR 2SC1623	
L230	1-410-383-31	INDUCTOR CHIP 15UH		Q251	8-729-216-22	TRANSISTOR 2SA1162	
L231	1-412-026-11	INDUCTOR CHIP 1UH		Q252	8-729-900-53	TRANSISTOR DTC114EK	
L501	1-410-390-11	INDUCTOR CHIP 56UH		Q253	8-729-102-06	TRANSISTOR 2SC2223-F13	
L502	1-412-032-11	INDUCTOR CHIP 100UH		Q254	8-729-805-45	TRANSISTOR 2SC3395	
L503	1-408-797-11	INDUCTOR CHIP 470UH		Q501	8-729-100-66	TRANSISTOR 2SC1623	
L601	1-412-031-11	INDUCTOR CHIP 47UH		Q502	8-729-100-66	TRANSISTOR 2SC1623	
L602	1-410-381-11	INDUCTOR CHIP 10UH		Q503	8-729-805-45	TRANSISTOR 2SC3395	
L603	1-412-029-11	INDUCTOR CHIP 10UH		Q551	8-729-901-06	TRANSISTOR DTA144EK	
L604	1-412-026-11	INDUCTOR CHIP 1UH		Q552	8-729-903-30	TRANSISTOR DTC144TK	
L605	1-412-026-11	INDUCTOR CHIP 1UH		Q553	8-729-903-30	TRANSISTOR DTC144TK	
L606	1-412-026-11	INDUCTOR CHIP 1UH		Q602	8-729-100-66	TRANSISTOR 2SC1623	
L607	1-412-032-11	INDUCTOR CHIP 100UH		Q603	8-729-216-22	TRANSISTOR 2SA1162	
L608	1-412-029-11	INDUCTOR CHIP 10UH		Q604	8-729-902-XX	TRANSISTOR DTC114TK	
L609	1-410-393-11	INDUCTOR CHIP 100UH		Q605	8-729-805-45	TRANSISTOR 2SC3395	
L610	1-412-029-11	INDUCTOR CHIP 10UH		Q606	8-729-805-45	TRANSISTOR 2SC3395	
L612	1-412-029-11	INDUCTOR CHIP 10UH		Q607	8-729-902-XX	TRANSISTOR DTC114TK	
L613	1-412-031-11	INDUCTOR CHIP 47UH		Q608	8-729-100-66	TRANSISTOR 2SC1623	
L614	1-410-657-21	INDUCTOR CHIP 180UH		Q609	8-729-100-66	TRANSISTOR 2SC1623	
L801	1-410-655-31	INDUCTOR CHIP 120UH		Q610	8-729-216-22	TRANSISTOR 2SA1162	
<u>TRANSISTOR</u>				Q611	8-729-100-66	TRANSISTOR 2SC1623	
Q202	8-729-100-66	TRANSISTOR 2SC1623		Q612	8-729-216-22	TRANSISTOR 2SA1162	
Q203	8-729-100-66	TRANSISTOR 2SC1623		Q614	8-729-216-22	TRANSISTOR 2SA1162	
Q204	8-729-103-96	TRANSISTOR 2SB798-T1DL		Q615	8-729-100-66	TRANSISTOR 2SC1623	
Q206	8-729-805-45	TRANSISTOR 2SC3395		Q617	8-729-100-66	TRANSISTOR 2SC1623	
Q207	8-729-805-45	TRANSISTOR 2SC3395		Q618	8-729-100-66	TRANSISTOR 2SC1623	
Q210	8-729-106-60	TRANSISTOR 2SB1115A		Q619	8-729-100-66	TRANSISTOR 2SC1623	
Q211	8-729-216-22	TRANSISTOR 2SA1162		Q620	8-729-100-66	TRANSISTOR 2SC1623	
Q212	8-729-100-66	TRANSISTOR 2SC1623		Q621	8-729-902-XX	TRANSISTOR DTC114TK	
Q213	8-729-216-22	TRANSISTOR 2SA1162		Q622	8-729-902-XX	TRANSISTOR DTC114TK	
Q214	8-729-100-66	TRANSISTOR 2SC1623		Q623	8-729-902-XX	TRANSISTOR DTC114TK	
				Q624	8-729-902-XX	TRANSISTOR DTC114TK	

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
Q625	8-729-216-22	TRANSISTOR 2SA1162		R214	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q626	8-729-100-66	TRANSISTOR 2SC1623		R215	1-216-022-00	METAL GLAZE 75 5%	1/10W
Q627	8-729-216-22	TRANSISTOR 2SA1162		R216	1-216-049-00	METAL GLAZE 1K 5%	1/10W
Q628	8-729-216-22	TRANSISTOR 2SA1162		R218	1-216-097-00	METAL GLAZE 100K 5%	1/10W
Q629	8-729-920-08	TRANSISTOR DTC124TK		R219	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
Q630	8-729-216-22	TRANSISTOR 2SA1162		R220	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q631	8-729-216-22	TRANSISTOR 2SA1162		R226	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
Q632	8-729-100-66	TRANSISTOR 2SC1623		R227	1-216-041-00	METAL GLAZE 470 5%	1/10W
Q633	8-729-216-22	TRANSISTOR 2SA1162		R231	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q634	8-729-100-66	TRANSISTOR 2SC1623		R232	1-216-027-00	METAL GLAZE 120 5%	1/10W
Q635	8-729-216-22	TRANSISTOR 2SA1162		R233	1-216-095-00	METAL GLAZE 82K 5%	1/10W
Q638	8-729-216-22	TRANSISTOR 2SA1162		R234	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q639	8-729-902-XX	TRANSISTOR DTC114TK		R235	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q641	8-729-100-66	TRANSISTOR 2SC1623		R236	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q642	8-729-216-22	TRANSISTOR 2SA1162		R237	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
Q644	8-729-216-22	TRANSISTOR 2SA1162		R238	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
Q645	8-729-100-66	TRANSISTOR 2SC1623		R240	1-216-117-00	METAL GLAZE 680K 5%	1/10W
Q646	8-729-216-22	TRANSISTOR 2SA1162		R241	1-216-093-00	METAL GLAZE 68K 5%	1/10W
Q647	8-729-100-66	TRANSISTOR 2SC1623		R242	1-216-666-11	METAL CHIP 4.3K 0.50%	1/10W
Q648	8-729-216-22	TRANSISTOR 2SA1162		R243	1-216-073-00	METAL GLAZE 10K 5%	1/10W
Q801	8-729-216-22	TRANSISTOR 2SA1162		R246	1-216-651-11	METAL CHIP 1K 0.50%	1/10W
Q802	8-729-100-66	TRANSISTOR 2SC1623		R247	1-216-643-11	METAL CHIP 470 0.50%	1/10W
Q803	8-729-402-19	TRANSISTOR XN6501		R248	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
Q804	8-729-402-19	TRANSISTOR XN6501		R249	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
Q806	8-729-100-66	TRANSISTOR 2SC1623		R250	1-216-041-00	METAL GLAZE 470 5%	1/10W
Q807	8-729-100-66	TRANSISTOR 2SC1623		R251	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
Q809	8-729-902-XX	TRANSISTOR DTC114TK		R252	1-216-113-00	METAL GLAZE 470K 5%	1/10W
Q810	8-729-902-XX	TRANSISTOR DTC114TK		R253	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
Q811	8-729-901-06	TRANSISTOR DTA144EK		R254	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q812	8-729-901-06	TRANSISTOR DTA144EK		R256	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q816	8-729-100-66	TRANSISTOR 2SC1623		R257	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q817	8-729-216-22	TRANSISTOR 2SA1162		R258	1-216-081-00	METAL GLAZE 22K 5%	1/10W
Q818	8-729-100-66	TRANSISTOR 2SC1623		R260	1-216-029-00	METAL GLAZE 150 5%	1/10W
Q819	8-729-805-25	TRANSISTOR 2SB1121		R261	1-216-121-00	METAL GLAZE 1M 5%	1/10W
Q820	8-729-100-66	TRANSISTOR 2SC1623		R262	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
Q822	8-729-216-22	TRANSISTOR 2SA1162		R263	1-216-047-00	METAL GLAZE 820 5%	1/10W
Q824	8-729-901-03	TRANSISTOR DTC144WK		R264	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
Q825	8-729-901-03	TRANSISTOR DTC144WK		R265	1-216-021-00	METAL GLAZE 68 5%	1/10W
Q826	8-729-216-22	TRANSISTOR 2SA1162		R266	1-216-083-00	METAL GLAZE 27K 5%	1/10W
Q827	8-729-100-66	TRANSISTOR 2SC1623		R267	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
Q828	8-729-216-22	TRANSISTOR 2SA1162		R268	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
Q830	8-729-903-30	TRANSISTOR DTC144TK		R269	1-216-043-00	METAL GLAZE 560 5%	1/10W
RESISTOR				R270	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R201	1-216-699-11	METAL CHIP 100K 0.50%	1/10W	R271	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R206	1-216-089-00	METAL GLAZE 47K 5%	1/10W	R274	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R207	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R283	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R208	1-216-047-00	METAL GLAZE 820 5%	1/10W	R284	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R209	1-216-079-00	METAL GLAZE 18K 5%	1/10W	R286	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R210	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W	R287	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R211	1-216-304-11	METAL GLAZE 3.3 5%	1/10W	R288	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R212	1-216-015-00	METAL GLAZE 39 5%	1/10W	R289	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W
R213	1-216-015-00	METAL GLAZE 39 5%	1/10W	R290	1-216-041-00	METAL GLAZE 470 5%	1/10W
				R291	1-216-021-00	METAL GLAZE 68 5%	1/10W

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R292	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R391	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R293	1-216-079-00	METAL GLAZE 18K 5%	1/10W	R392	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R294	1-216-079-00	METAL GLAZE 18K 5%	1/10W	R393	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R296	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R394	1-216-113-00	METAL GLAZE 470K 5%	1/10W
R297	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W	R395	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R298	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R396	1-216-033-00	METAL GLAZE 220 5%	1/10W
R300	1-216-085-00	METAL GLAZE 33K 5%	1/10W	R399	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R301	1-216-043-00	METAL GLAZE 560 5%	1/10W	R403	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W
R302	1-216-037-00	METAL GLAZE 330 5%	1/10W	R404	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W
R303	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R405	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
R304	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W	R406	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R305	1-216-027-00	METAL GLAZE 120 5%	1/10W	R407	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R306	1-216-045-00	METAL GLAZE 680 5%	1/10W	R408	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R307	1-216-033-00	METAL GLAZE 220 5%	1/10W	R409	1-216-045-00	METAL GLAZE 680 5%	1/10W
R309	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R410	1-216-025-00	METAL GLAZE 100 5%	1/10W
R310	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R411	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W
R311	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R412	1-216-131-11	METAL GLAZE 2.7M 5%	1/10W
R312	1-216-043-00	METAL GLAZE 560 5%	1/10W	R414	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R313	1-216-025-00	METAL GLAZE 100 5%	1/10W	R415	1-216-113-00	METAL GLAZE 470K 5%	1/10W
R314	1-216-041-00	METAL GLAZE 470 5%	1/10W	R501	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R315	1-216-041-00	METAL GLAZE 470 5%	1/10W	R502	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R316	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R503	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R317	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W	R504	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R318	1-216-043-00	METAL GLAZE 560 5%	1/10W	R505	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R319	1-216-043-00	METAL GLAZE 560 5%	1/10W	R506	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R320	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R507	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R321	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R508	1-216-075-00	METAL GLAZE 12K 5%	1/10W
R322	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R509	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R323	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R510	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R324	1-216-025-00	METAL GLAZE 100 5%	1/10W	R511	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R332	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R512	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R333	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R513	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R334	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W	R514	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R335	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W	R515	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R336	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R516	1-216-083-00	METAL GLAZE 27K 5%	1/10W
R337	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R517	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R348	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R518	1-216-085-00	METAL GLAZE 33K 5%	1/10W
R353	1-216-089-00	METAL GLAZE 47K 5%	1/10W	R519	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R355	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R520	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R358	1-216-295-00	METAL GLAZE 0 5%	1/10W	R521	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R369	1-216-079-00	METAL GLAZE 18K 5%	1/10W	R522	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R376	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R523	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R377	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R524	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R378	1-216-748-11	METAL GLAZE 39K 5%	1/10W	R525	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R380	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R526	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R381	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R527	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R382	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W	R551	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R383	1-216-045-00	METAL GLAZE 680 5%	1/10W	R552	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R384	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W	R553	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R385	1-216-045-00	METAL GLAZE 680 5%	1/10W	R603	1-216-053-00	METAL GLAZE 1.5K 5%	1/10W
R386	1-216-748-11	METAL GLAZE 39K 5%	1/10W	R604	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
R387	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R605	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W
R389	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R606	1-216-073-00	METAL GLAZE 10K 5%	1/10W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R607	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R674	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R608	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R675	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R609	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R677	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R610	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R681	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R611	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R682	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R612	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R685	1-216-079-00	METAL GLAZE 18K 5%	1/10W
R613	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R686	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R614	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R687	1-216-041-00	METAL GLAZE 470 5%	1/10W
R615	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R688	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W
R616	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R690	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R617	1-216-134-00	METAL GLAZE 2.2 5%	1/8W	R696	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R618	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W	R697	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W
R619	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R698	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R620	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R699	1-216-295-00	METAL GLAZE 0 5%	1/10W
R621	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R700	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R622	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R702	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R623	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R703	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R624	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R705	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R625	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R711	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R626	1-216-068-00	METAL GLAZE 6.2K 5%	1/10W	R713	1-216-748-11	METAL GLAZE 39K 5%	1/10W
R627	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R715	1-216-075-00	METAL GLAZE 12K 5%	1/10W
R628	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R716	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R629	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R717	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R630	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R718	1-216-045-00	METAL GLAZE 680 5%	1/10W
R631	1-216-031-00	METAL GLAZE 180 5%	1/10W	R719	1-216-075-00	METAL GLAZE 12K 5%	1/10W
R632	1-216-077-00	METAL GLAZE 15K 5%	1/10W	R720	1-216-077-00	METAL GLAZE 15K 5%	1/10W
R633	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R721	1-216-079-00	METAL GLAZE 18K 5%	1/10W
R634	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R722	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R635	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R723	1-216-079-00	METAL GLAZE 18K 5%	1/10W
R636	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R724	1-216-077-00	METAL GLAZE 15K 5%	1/10W
R637	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R726	1-216-052-00	METAL GLAZE 1.3K 5%	1/10W
R638	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R728	1-216-068-00	METAL GLAZE 6.2K 5%	1/10W
R639	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R729	1-216-039-00	METAL GLAZE 390 5%	1/10W
R640	1-216-097-00	METAL GLAZE 100K 5%	1/10W	R730	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W
R641	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R731	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R642	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R732	1-216-075-00	METAL GLAZE 12K 5%	1/10W
R643	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R733	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R644	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R734	1-216-079-00	METAL GLAZE 18K 5%	1/10W
R645	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R735	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W
R646	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R736	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R647	1-216-055-00	METAL GLAZE 1.8K 5%	1/10W	R737	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R648	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R738	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R649	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R739	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
R650	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R740	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R651	1-216-103-00	METAL GLAZE 180K 5%	1/10W	R741	1-216-093-00	METAL GLAZE 68K 5%	1/10W
R652	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R742	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R653	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R744	1-216-089-00	METAL GLAZE 47K 5%	1/10W
R656	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R745	1-216-748-11	METAL GLAZE 39K 5%	1/10W
R657	1-216-748-11	METAL GLAZE 39K 5%	1/10W	R746	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R658	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R747	1-216-085-00	METAL GLAZE 33K 5%	1/10W
R659	1-216-033-00	METAL GLAZE 220 5%	1/10W	R749	1-216-121-00	METAL GLAZE 1M 5%	1/10W
R660	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R750	1-216-103-00	METAL GLAZE 180K 5%	1/10W
R662	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R751	1-216-097-00	METAL GLAZE 100K 5%	1/10W

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R752	1-216-047-00	METAL GLAZE 820 5%	1/10W	R819	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R753	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R820	1-216-045-00	METAL GLAZE 680 5%	1/10W
R754	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R821	1-216-095-00	METAL GLAZE 82K 5%	1/10W
R755	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R822	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R757	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R823	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R758	1-216-047-00	METAL GLAZE 820 5%	1/10W	R824	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R759	1-216-072-00	METAL GLAZE 9.1K 5%	1/10W	R825	1-216-093-00	METAL GLAZE 68K 5%	1/10W
R760	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W	R826	1-216-748-11	METAL GLAZE 39K 5%	1/10W
R761	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R827	1-216-113-00	METAL GLAZE 470K 5%	1/10W
R762	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R828	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R763	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R829	1-216-121-00	METAL GLAZE 1M 5%	1/10W
R764	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R831	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R765	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W	R832	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R767	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W	R833	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R768	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R836	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R770	1-216-085-00	METAL GLAZE 33K 5%	1/10W	R837	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R771	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R838	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R772	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W	R839	1-216-043-00	METAL GLAZE 560 5%	1/10W
R773	1-216-091-00	METAL GLAZE 56K 5%	1/10W	R840	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R774	1-216-089-00	METAL GLAZE 47K 5%	1/10W	R841	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R776	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R842	1-216-134-00	METAL GLAZE 2.2 5%	1/8W
R777	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R843	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R780	1-216-089-00	METAL GLAZE 47K 5%	1/10W	R844	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W
R781	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R845	1-216-063-00	METAL GLAZE 3.9K 5%	1/10W
R782	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R846	1-216-033-00	METAL GLAZE 220 5%	1/10W
R783	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R847	1-216-033-00	METAL GLAZE 220 5%	1/10W
R785	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R848	1-216-033-00	METAL GLAZE 220 5%	1/10W
R786	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R849	1-216-144-00	METAL GLAZE 5.6 5%	1/8W
R787	1-216-295-00	METAL GLAZE 0 5%	1/10W	R850	1-216-134-00	METAL GLAZE 2.2 5%	1/8W
R788	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W	R857	1-216-069-00	METAL GLAZE 6.8K 5%	1/10W
R789	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R858	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W
R790	1-216-295-00	METAL GLAZE 0 5%	1/10W	R859	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W
R791	1-216-059-00	METAL GLAZE 2.7K 5%	1/10W	R860	1-216-748-11	METAL GLAZE 39K 5%	1/10W
R792	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R861	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R793	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R862	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R801	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R863	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R802	1-216-158-11	METAL GLAZE 27K 1%	1/10W	R864	1-216-083-00	METAL GLAZE 27K 5%	1/10W
R803	1-216-324-11	METAL GLAZE 10K 1%	1/10W	R865	1-216-091-00	METAL GLAZE 56K 5%	1/10W
R804	1-216-324-11	METAL GLAZE 10K 1%	1/10W	R866	1-216-097-00	METAL GLAZE 100K 5%	1/10W
R805	1-216-073-00	METAL GLAZE 10K 5%	1/10W	R867	1-216-105-00	METAL GLAZE 220K 5%	1/10W
R806	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R868	1-216-071-00	METAL GLAZE 8.2K 5%	1/10W
R807	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R869	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R808	1-216-043-00	METAL GLAZE 560 5%	1/10W	R870	1-216-081-00	METAL GLAZE 22K 5%	1/10W
R809	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R871	1-216-295-00	METAL GLAZE 0 5%	1/10W
R810	1-216-043-00	METAL GLAZE 560 5%	1/10W	R872	1-216-073-00	METAL GLAZE 10K 5%	1/10W
R811	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W	R873	1-216-025-00	METAL GLAZE 100 5%	1/10W
R812	1-216-033-00	METAL GLAZE 220 5%	1/10W	R874	1-216-093-00	METAL GLAZE 68K 5%	1/10W
R813	1-216-134-00	METAL GLAZE 2.2 5%	1/8W	R875	1-216-049-00	METAL GLAZE 1K 5%	1/10W
R814	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W	R876	1-216-101-00	METAL GLAZE 150K 5%	1/10W
R815	1-216-017-00	METAL GLAZE 47 5%	1/10W	R877	1-216-065-00	METAL GLAZE 4.7K 5%	1/10W
R816	1-216-057-00	METAL GLAZE 2.2K 5%	1/10W	R878	1-216-748-11	METAL GLAZE 39K 5%	1/10W
R817	1-216-081-00	METAL GLAZE 22K 5%	1/10W	R879	1-216-121-00	METAL GLAZE 1M 5%	1/10W
R818	1-216-049-00	METAL GLAZE 1K 5%	1/10W	R880	1-216-025-00	METAL GLAZE 100 5%	1/10W

When indicating parts by reference number, please include the board name.

CV-8**LI-5****KS-6****RC-29****FP-89**

Ref.No	Part No.	Description	Remark
R881	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R882	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R883	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R884	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R885	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R886	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R887	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R888	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R889	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R890	1-216-144-00	METAL GLAZE 5.6 5% 1/8W	
R891	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R892	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R893	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R894	1-216-748-11	METAL GLAZE 39K 5% 1/10W	
R895	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R896	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R897	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R898	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R899	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	

VARIABLE RESISTOR

RV201	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV202	1-230-870-11	RES, ADJ, METAL GLAZE 10K
RV203	1-230-873-11	RES, ADJ, METAL GLAZE 47K
RV204	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K
RV205	1-230-869-11	RES, ADJ, METAL GLAZE 4.7K
RV206	1-230-867-11	RES, ADJ, METAL GLAZE 1K
RV207	1-230-868-11	RES, ADJ, METAL GLAZE 2.2K
RV208	1-230-866-11	RES, ADJ, METAL GLAZE 470
RV209	1-230-867-11	RES, ADJ, METAL GLAZE 1K
RV552	1-230-874-11	RES, ADJ, METAL GLAZE 100K
RV801	1-230-875-21	RES, ADJ, METAL GRAZE 220K

CRYSTAL

X201	1-577-080-11	VIBRATOR, CRYSTAL (3.58MHz)
X601	1-577-118-11	VIBRATOR, LITHIUM NIOBATE (4MHz)
X603	1-567-898-11	OSCILLATOR, CRYSTAL (28MHz)

*1-629-372-12 LI-5 BOARD (Ref.No 3,000 Series)

RESISTOR

R938	1-216-295-00	METAL GLAZE 0 5% 1/10W
R939	1-216-295-00	METAL GLAZE 0 5% 1/10W
R940	1-216-081-00	METAL GLAZE 22K 5% 1/10W
R941	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W

CONNECTOR

W802	1-574-457-12	CABLE, FLAT (1.0MM PITCH) 23P
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Ref.No	Part No.	Description	Remark
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*1-631-827-11	KS-6 BOARD (Ref.No 8,000 Series)	*****	
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CONNECTOR

CN501	*1-562-880-21	CONNECTOR, CARD EDGE 15P	
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CONNECTOR

W502	1-574-456-11	CABLE, FLAT (1.0MM PITCH) 15P	
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*1-631-831-11	RC-29 BOARD (Ref.No 10,000 Series)	*****	
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CONNECTOR

CN401	1-566-760-11	PIN, CONNECTOR (PC BOARD) 5P	
CN951	1-566-192-11	PIN, CONNECTOR (PC BOARD) 13P	
CN952	*1-566-182-11	PIN, CONNECTOR (PC BOARD) 3P	

JACK

J951	1-565-276-11	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-507-921-00	JACK (②)	

COIL

L991	1-410-369-11	INDUCTOR CHIP 1UH	
L992	1-410-369-11	INDUCTOR CHIP 1UH	
L993	1-410-369-11	INDUCTOR CHIP 1UH	
L994	1-410-369-11	INDUCTOR CHIP 1UH	

RESISTOR

R995	1-216-296-00	METAL GLAZE 0 5% 1/8W	
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SWITCH

S951	1-553-977-00	SWITCH, SLIDE (STANDBY)	
S952	1-571-838-11	SWITCH, TACTIL (START/STOP)	

1-628-060-12	FP-89 FLEXIBLE BOARD (Ref.No 6,000 Series)	*****	
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1-571-664-11	SWITCH, SLIDE (ENCODER)		
3-728-869-02	HOLDER, SENSOR		

DIODE

D301	8-719-800-44	PHOTO COUPLER TLP907-0	
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TRANSISTOR

Q301	8-729-906-48	TRANSISTOR EE-TP109	
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When indicating parts by reference number, please include the board name.

FP-90

Ref.No	Part No.	Description	Remark
	1-628-061-12	FP-90 FLEXIBLE BOARD (Ref.No 8,000 Series)	

3-728-837-01	HOLDER, LED
3-728-869-02	HOLDER, SENSOR

DIODE

D302	8-719-940-81	DIODE GL452S
D303	8-719-820-44	PHOTO COUPLER TLP907-0

TRANSISTOR

Q302	8-729-906-48	TRANSISTOR EE-TP109
------	--------------	---------------------

SWITCH

S302	1-571-680-11	SWITCH, PUSH (3 KEY) (REC PROOF/TAPE SELECT)
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MISCELLANEOUS

△	1-451-310-21	DEFLECTION YOKE (R/W)
	1-542-125-21	MICROPHONE (C-2027)
	1-808-505-12	SENSOR (DEW)
IC601	A-7030-124-A	IC ICX026BK-2 (CCD IMAGER)
M902	8-835-331-01	MOTOR, DC U-22A (CAPSTAN)
M903	A-7040-160-A	MOTOR ASSY, THREADING
S901	1-571-837-11	SWITCH, PUSH (ZOOM)
S903	1-571-099-11	SWITCH (CASSETTE DOWN)
V901	△ 1-452-482-11	CRT ASSY (M91JYZ60WB) (VF-14 BOARD)
V901	△ 1-546-065-11	CATHODE-RAY TUBE, B/W (MOIJVV47WB) (VF-22 BOARD)

ACCESSORIES AND PACKING MATERIALS

Part No.	Description	Remark
*3-340-514-01	BAG, PROTECTION	
3-701-625-00	BAG, POLYETHYLENE	
*3-732-952-01	CUSHION (UPPER)	
*3-732-953-01	CUSHION (LOWER)	
3-735-474-01	FLYER, PV/DECK (US MODEL (CCD-F45/F46))	
3-750-731-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH) (CCD-F45)	
3-750-731-81	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH) (CCD-F360)	
3-750-731-91	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH) (CCD-F46)	
*3-764-631-12	INSTRUCTION, DEW CONDENSATION (CCD-F360)	

**** ACCESSORIES AND PACKING MATERIALS (KIT) ****

A-6767-701-A	RFU ADAPTOR (RFU-89UCA) (CCD-F45/F46)
A-6767-816-A	RFU ADAPTOR (RFU-89NA) (CCD-F360)
*1-571-163-31	SWITCH, ANTENNA CHANGE (CABLE)
*3-733-938-01	CUSHION, ACC
3-733-958-01	BELT, CARRYING (CCD-F45 (CANADIAN MODEL))
*3-733-977-41	INDIVIDUAL CARTON (CCD-F45)
*3-733-977-71	INDIVIDUAL CARTON (CCD-F46)
*3-737-771-11	INDIVIDUAL CARTON (CCD-F360)

** AC-V30	AC POWER ADAPTOR
*** NP-55	RECHARGEABLE BATTERY

Note

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

HARDWARE LIST

SCREW

7-621-281-15	SCREW +P 2X2
7-621-772-00	SCREW +B 2X3
7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3
7-627-553-48	PRECISION SCREW +P 2X4 TYPE 3

STEAL BALL

7-671-113-02	STEAL, BALL 3
7-671-156-01	BALL, STAINLESS

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

SECTION 7

CAMERA ADJUSTMENTS

During the adjustment, see the adjustment element location to the adjustment from page 234.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Regulated power supply (2 units)
- Adjusting screwdriver
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction (Combination of C2 and C12)	J-6080-058-A	Auto white balance confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, iris in/out adjustment (two used), max. gain adjustment
	ND filter 0.1	J-6080-807-A	Iris adjustment, iris in/out adjustment
J-3	Pattern box PTB-500 *	J-6029-140-A	
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment
J-6	AF microcomputer data reading jig	J-6082-025-A	
J-7	Adjustment remote controller	J-6082-053-A	

* PTB-100 is not available.

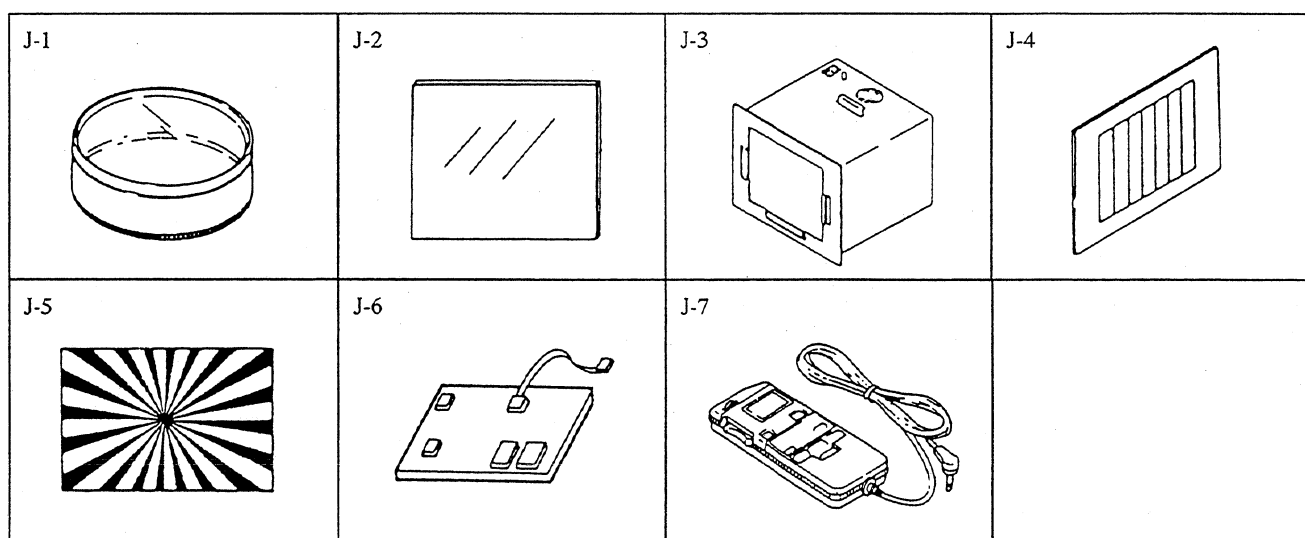


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "2. DISASSEMBLY" for details on removal of the cabinet and various boards.

- 1) Connect the various devices for adjustment as shown in Fig. 7-3.
- 2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. This can be confirmed on the monitor screen by turning on the data screen (ON/OFF by S509 on VK-3 board). Remove CN901 on the CV-8 board when the EVF is not needed.
- 3) The mic amplifier (MA-37 board) is not needed. Remove CN401 on the CO-2 board.

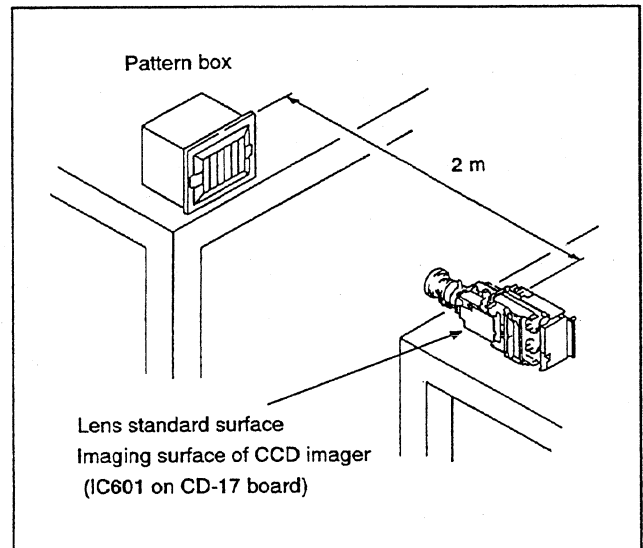


Fig. 7-2.

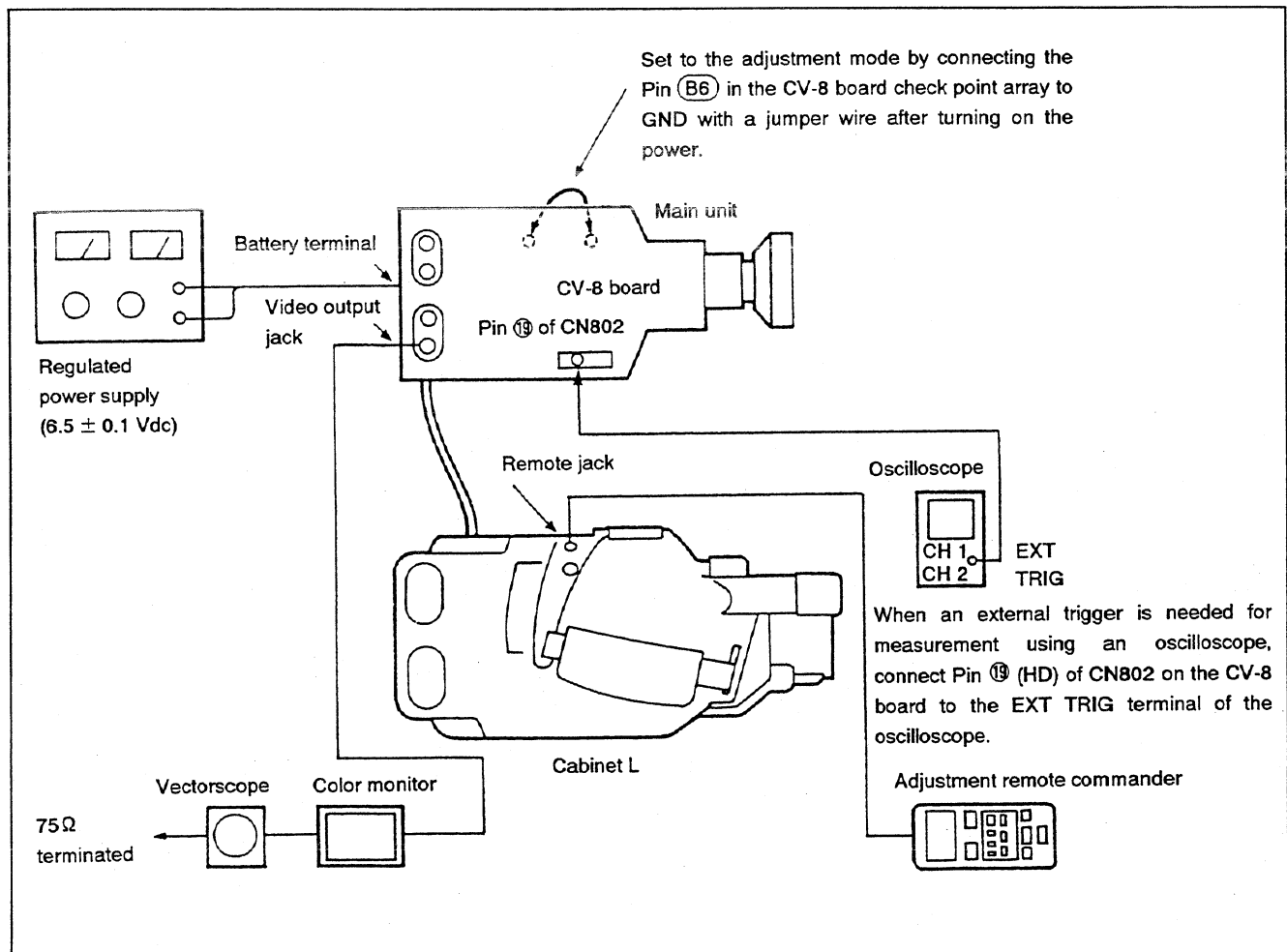


Fig. 7-3.

7-1-3. Precautions

1) Setting of Switches

Unless indicated otherwise, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S501 on VK-3 board)
.....camera
2. Standby switch (S951 on RC-29 board) ON
3. Auto-lock switch (S651 on CK-19 board) OFF
4. White balance button (S654 on CK-19 board)
..... $\star$ (indoors white balance mode)
5. Shutter button (S652 on CK-19 board)
.....normal (1/60)

2) Adjustment Order

As a rule, the adjustments are performed in the listed order.

3) Subjects

1. Color bar chart (standard picture frame)

When performing adjustment using the color bar chart, adjusting the picture frame shown in Fig. 7-4. (standard picture frame).

2. White pattern (standard picture frame)

Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is the same position as the color bar chart (standard picture frame).

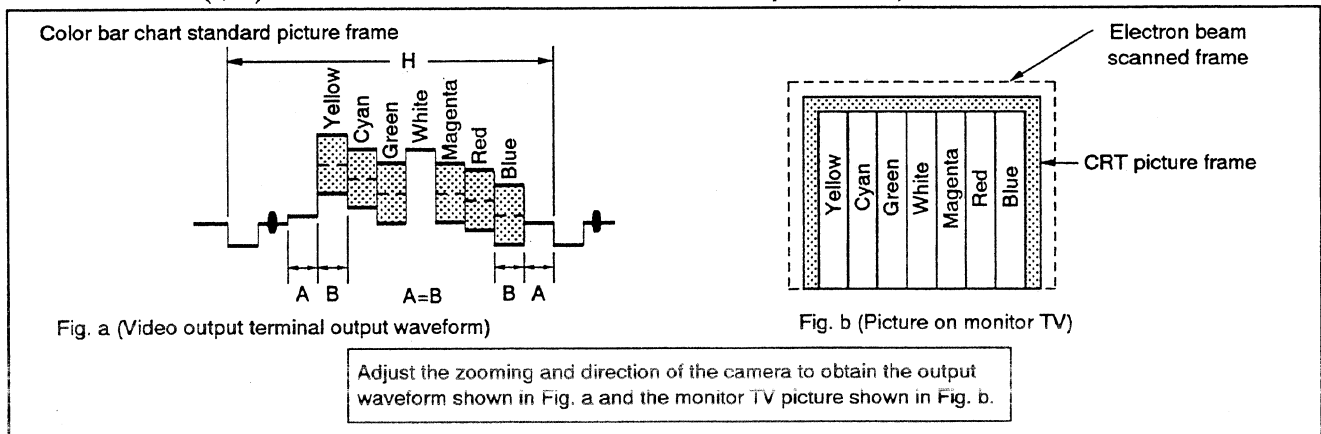


Fig. 7-4.

3. All white pattern

Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (68 mm) side.

4. High luminance pattern

Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.

5. Siemens star (J-6080-875-A)

Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

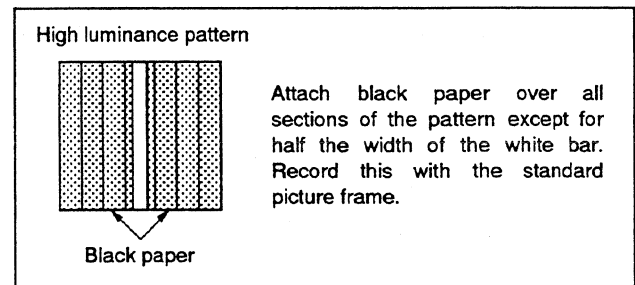


Fig. 7-5.

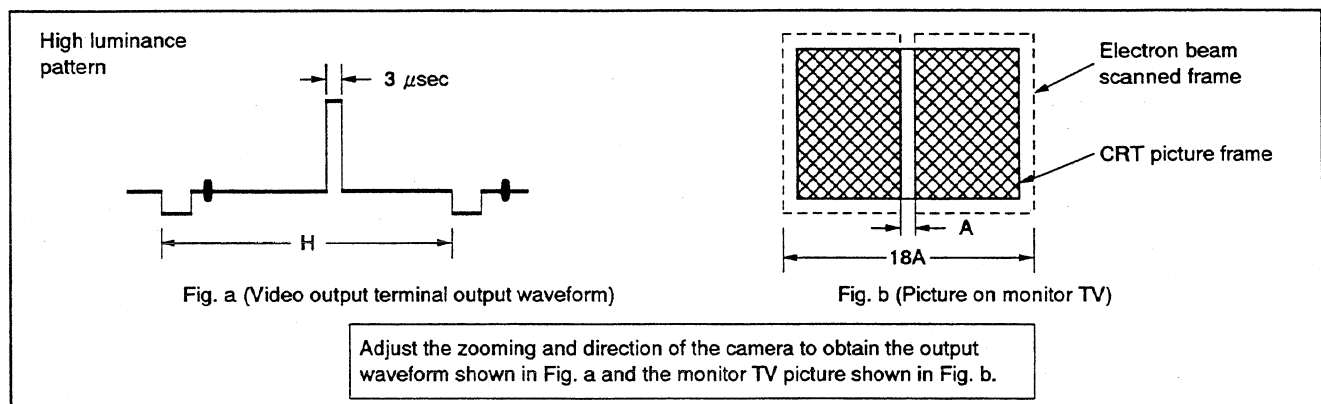


Fig. 7-6.

7-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microcomputer (IC601 on CV-8 board). This microcomputer reads the data written in the nonvolatile memory of the microcomputer and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microcomputer using the remote control signal lines (LINC/S). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microcomputer from the adjustment remote controller. Adjustment addresses and adjustment data are sent from the camera block microcomputer to the adjustment remote controller.

1. Use of adjustment remote controller

Solder the lead wire to Pin (B6) (refer to 7-1-5) of the check point array on the CV-8 board.

- 1) Connect the adjustment remote controller to the remote terminal (J951 on RC-29 board). (Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).)
- 2) Turn on the power of the main unit.
- 3) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.

(This connection causes the EVR/AWB microcomputer to cease normal remote control operation and to begin adjustment dedicated communications.)

Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote controller if the connection is normal. (Adjustment data varies according to the unit.)

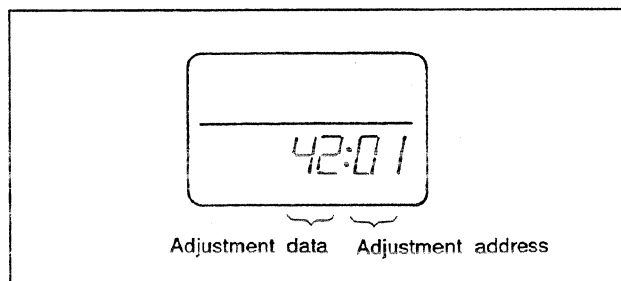


Fig. 7-7.

- 4) Designate the desired adjustment address using the adjustment remote controller. The adjustment address is incremented by pressing the FF (▶▶) button and decremented by pressing the REW (◀◀) button. (The adjustment address is indicated in decimal, and there are 89 addresses from 01 to 89. The adjustment address corresponds to the EVR (CV-8 board, IC608, IC609, IC804) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)

- 5) Perform adjustment by incrementing or decrementing the adjustment data.

The adjustment data is incremented by pressing the PLAY (▶) button. The adjustment data is decremented by pressing the STOP (■) button.

- The adjustment data is indicated in hexadecimal. There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Indication on LCD	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

- The adjustment data corresponds to the EVR (CV-8 board, IC608, IC609, IC804) output voltage, and is as follows.

Adjustment data () is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
F0 (=240)	
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
10 (=16)	
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

- 6) The adjustment address is changed using the FF (▶▶) button or REW (◀◀) button to store the adjustment data in the nonvolatile memory of EVR/AWB microcomputer (IC601 on CV-8 board).

(The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

3. Adjustment address table

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column
01	Pin ⑮ of IC609	DELTA R	Auto white balance adjustment	
02	Pin ⑰ of IC609	DELTA B		
03	Pin ② of IC609	TITLE PEDESTAL		
04	Pin ③ of IC609	C-PED	Fixed at "99"	99
05	Pin ④ of IC609	R-Y GAIN	Color reproduction (gain) adjustment	
06	Pin ⑤ of IC609	B-Y GAIN		
07	Pin ⑥ of IC609	B-Y HUE	Color reproduction (hue) adjustment	
08	Pin ⑦ of IC609	R-Y HUE		
09	Pin ⑧ of IC609	C LEVEL		
10	Pin ⑨ of IC609	Y GAIN		
11	Pin ⑫ of IC609	R GAIN	Pre-white balance adjustment	
12	Pin ⑬ of IC609	B GAIN		
13	Pin ⑮ of IC608	C2 GAIN	Chroma matrix adjustment	
14	Pin ⑰ of IC608	C1 GAIN		
15	Pin ② of IC608	Y1 GAIN	Y matrix adjustment	
16	Pin ③ of IC608	HUE CONT	Fixed at "AE"	AE
17	Pin ④ of IC608	WC	White clip adjustment	
18	Pin ⑤ of IC608	Y LEVEL		
19	Pin ⑥ of IC608	SET UP		
20	Pin ⑦ of IC608	SYNC LEVEL		
21	Pin ⑧ of IC608	APERTURE	Aperture adjustment	
22	Pin ⑨ of IC608	BURST LEVEL		
23		————		—
24	Pin ⑤ of IC804	CHARACTER		
25	Pin ⑮ of IC804	IRIS		
26	Pin ⑰ of IC804	FOCUS SPEED		
27	Pin ② of IC804	HALL OFFSET		
28	Pin ③ of IC804	MAX GAIN		
29	Pin ④ of IC804	TITLE A/D		
30		————		—
31	Pin ⑥ of IC804	V SUB		
32	Pin ⑦ of IC804	AGC		
33		————		—
34		————		—
35		————		—
36		————		—

Table 7-3. (1)

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column	
37		MODE	The following adjustment modes are selected by changing the adjustment data.	00	
			Adjustment data		Adjustment mode
			00		Release
			01		Focus hunching
			03		Zoom position
			05		Hall, iris close
			07		Hall, iris open
			09		Hall in/out threshold
			0B		Auto-focus LLA
			FD		Auto-focus filter fixed at FA
			FF		Auto-focus filter fixed at FH
38		LLA	Auto-focus LLA adjustment		
39		MACRO			
40		IN/OUT DOOR	Fixed at 00	00	
41		LOW CONT	Auto-focus adjustment		
42		BASE H	Auto-focus adjustment		
43		STAPA	Fixed at 02	02	
44		WIDE THR	Fixed at 15	15	
45		Hysteresis			
46		HALL LEVEL			
47		THR SEARCH	Fixed at 06	06	
48		FA BASE	Fixed at 28	28	
49		KATAMUKI	Auto-focus adjustment		
50		FH-NG-NG-THR	Fixed at 05	05	
51		BACK RUSH	Fixed at 03	03	
52		TOP CHECK SEARCH	Fixed at 02	02	
53		TOP LIMIT	Fixed at 03	03	
54		CHECK PLUS	Fixed at 50	50	
55		MANU F SPEED	Fixed at 04	04	
56		M12 THR	Fixed at C8	C8	
57, 58		———	Not used	—	
59		START R	Preset R CONT data for reset start	30	
60		START B	Preset B CONT data for reset start	41	
61		BTM SLP R	Fixed at 22	22	
62		BTM SLP B	Fixed at 10	10	
63		MDL SLP R	Fixed at 00	00	
64		MDL SLP B	Fixed at 00	00	
65		TOP SLP R	Auto white balance adjustment		
66		TOP SLP B			
67		KEIKO R	Fixed at 10	10	
68		KEIKO B	Fixed at 00	00	
69		BTM UP	Fixed at 89	89	
70		BTM DWN	Fixed at 67	67	

Table 7-3. (2)

Adjustment Address	Adjustment Voltage Output Terminal	Adjustment Item	Remarks	Adjustment Data Memo Column										
71		MDL UP	Fixed at 7C	7C										
72		MDL DWN	Fixed at 6A	6A										
73		TOP UP	Auto white balance adjustment											
74		TOP DWN												
75		KEIKO DWN	Fixed at 8C	8C										
76		R DWN LMT	Fixed at 1E	1E										
77		B UP LMT	Auto white balance adjustment											
78		R OUT LMT												
79		B OUT LMT												
80		R OUTDOOR												
81		B OUTDOOR												
82		AWB	Fixed at 23	23										
83		DELAY TM	Auto white balance tracking speed. Fixed at 15	15										
84		FAST TM	Fixed at 20	20										
85		CAM DDS 0	Fixed at 00	00										
86			Fixed at 00	00										
87			Fixed at 00	00										
88		CAM ALN	Fixed at 00	00										
89		AWB mode	The following auto white balance adjustment modes are selected by changing the adjustment data. <table><tr><th>Adjustment data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Release</td></tr><tr><td>10</td><td>White balance value output (within tracking zone)</td></tr><tr><td>E0</td><td>Auto white balance adjustment possible</td></tr><tr><td>F0</td><td>Auto white balance tracking zone evaluation invalid</td></tr></table>	Adjustment data	Adjustment mode	00	Release	10	White balance value output (within tracking zone)	E0	Auto white balance adjustment possible	F0	Auto white balance tracking zone evaluation invalid	00
Adjustment data	Adjustment mode													
00	Release													
10	White balance value output (within tracking zone)													
E0	Auto white balance adjustment possible													
F0	Auto white balance tracking zone evaluation invalid													

Table 7-3. (3)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the CV-8 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.

The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT	B1	N.C
A2	N.C	B2	N.C
A3	N.C	B3	Y(LPF)OUT
A4	Y0	B4	V SUB
A5	Y1	B5	AW ADJ
A6	C0	B6	CAM ADJ
A7	C1	B7	MODE
A8	N.C	B8	VIDEO OUT
A9	YH	B9	SHUTTER EN
A10	N.C	B10	GND
A11	N.C	B11	CCD OUT

Table 7-4.

* N.C.....no connection

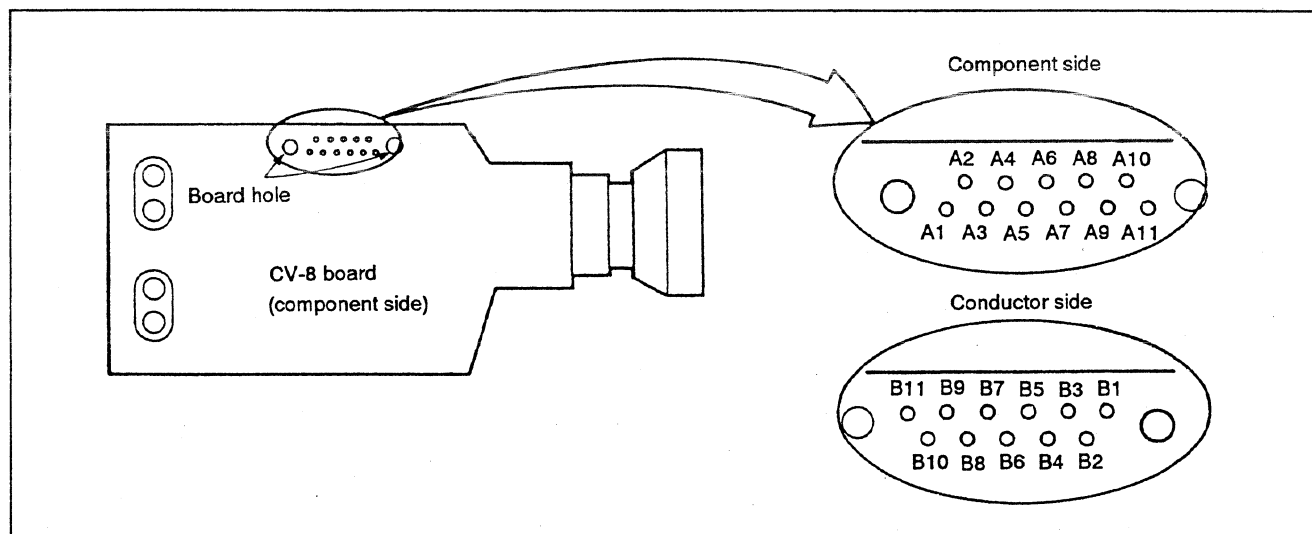


Fig. 7-8.

7-1-6. AF Microcomputer Data Reading Jig

The AF microcomputer data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microcomputer (IC802 on CV-8 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:
Connect as shown in the diagram below.

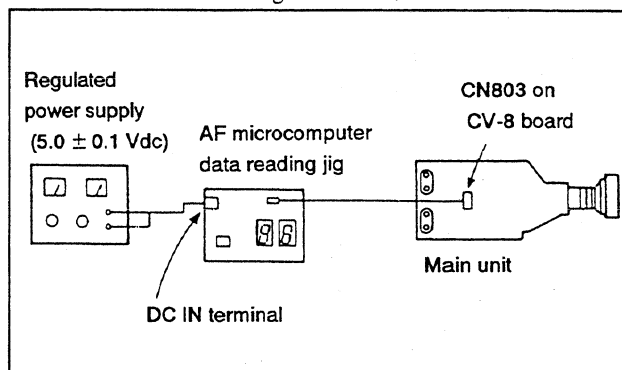


Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microcomputer data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal-decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (<i>A</i>)	B (<i>b</i>)	C (<i>c</i>)	D (<i>d</i>)	E (<i>E</i>)	F (<i>F</i>)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(<i>A</i>)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
B(<i>b</i>)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(<i>c</i>)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(<i>d</i>)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(<i>E</i>)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(<i>F</i>)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: () is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (*b d*).

As the upper digit is B (*b*) and the lower digit is D (*d*), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENT

7-2-1. Flange Back Adjustment

Subject	Siemens star (2m directly in front of lens reference ("⊕" marked))
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjustment Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (-) screwdriver

Adjustment method:

- 1) Press the FOCUS switch (S655 on CK-19 board) to set to the MANUAL mode.
- 2) Position a Siemens star 2m directly in front of the lens reference plane (See Fig. 7-2.).
- 3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
- 4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (8.5 mm) and TELE position (68 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
- 5) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 07. (Iris open mode) At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
- 6) Set the lens focusing mark at the center of "2".

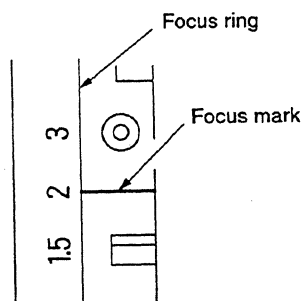


Fig. 7-10.

- 7) Open the DK-4 board and loosen flange back setscrew ① with a Phillips screwdriver. (See Fig. 7-12.)
- 8) By turning the flange back adjusting pin ② while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
Note: Do not turn the adjusting pin excessively in either direction.
- 9) While holding the flange back adjusting pin ② to prevent further rotation, retighten the flange back setscrew ①

- 10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark position is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.3m) and far (∞) extremes and confirm that the wedge is no longer in focus.

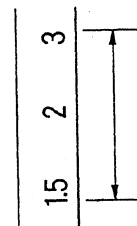


Fig. 7-11.

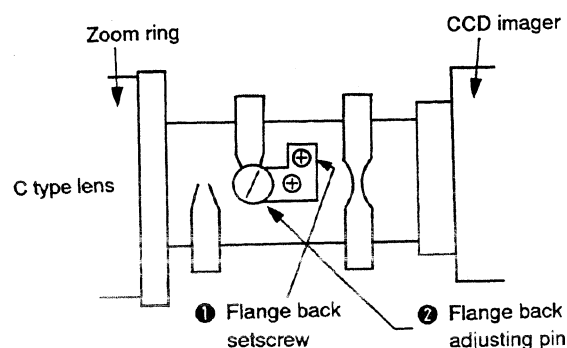


Fig. 7-12.

- 11) Fix the zoom lever at the extreme TELE position.
- 12) Turn the focusing ring and stop at the position where the wedge has optimum definition.
Confirm that the focus mark is within ± 1.5 mm of "2".
- 13) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 00. (Iris normal)
- 14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. 15V Power Supply Adjustment (PS-225 Board)

Measurement Point	Pin ② of W902
Measuring Instrument	Digital voltmeter
Adjustment Element	RV937
Specified Value	15.0 ± 0.5 Vdc

Adjustment method:

- 1) Adjust to 15.0 ± 0.5 Vdc with RV937.

7-2-3. Power Supply Check (PS-225 Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurement Point	Pin ④ of W902
Specified Value	5.05 ± 0.2 Vdc
32V Check	
Measurement Point	Pin ① of W902
Specified Value	32 ± 2 Vdc

Checking method:

- 1) Each power supply voltage should be at its specified level.

7-2-4. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microcomputer (IC602 on CV-8 board) was replaced.

Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value	Adjustment Address	Adjustment Data Initial Value
01 (DELTA R)	50	44 (WIDE THR)	15	67 (KEIKO R)	10
02 (DELTA B)	50	47 (THR SEARCH)	06	68 (KEIKO B)	00
04 (C-PED)	99	48 (FA BASE)	28	69 (BTM UP)	89
16 (HUE CONT)	AE	49 (KATAMUKI)	06	70 (BTM DWN)	67
17 (WHITE CLIP)	FF	50 (FH-NG-NG-THR)	05	71 (MDL UP)	7C
18 (Y LEVEL)	40	51 (BACK RUSH)	03	72 (MDL DWN)	6A
25 (IRIS)	80	52 (TOP CHECK-SEARCH)	02	75 (KEIKO DWN)	8C
28 (MAX GAIN)	B0	53 (TOP LIMIT)	03	76 (R DWN LMT)	1E
31 (V SUB)	80	54 (CHECK-PLUS)	50	78 (R OUT LMT)	2D
32 (AGC)	FF	55 (MANU-F-SPEED)	04	82 (AWB)	23
37 (MODE)	00	56 (M12-THR)	C8	83 (D TM)	15
38 (LLA)	3F	59 (START R)	30	84 (F TM)	20
39 (MACRO)	00	60 (START B)	41	85 (CAM DDS O)	00
40 (IN/OUT DOOR)	00	61 (BTM SLP R)	22	86	00
41 (LOW CONT)	03	62 (BTM SLP B)	10	87	00
42 (BASE H)	03	63 (MDL SLP R)	00	88 (CAM ALN)	00
43 (STAPA)	02	64 (MDL SLP B)	00	89 (AWB MODE)	00

Table 7-6.

Adjustment method:

- 1) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
- 2) Change the adjustment address to store the last adjustment data in the memory.

7-2-5. V SUB Adjustment (CV-8 Board)

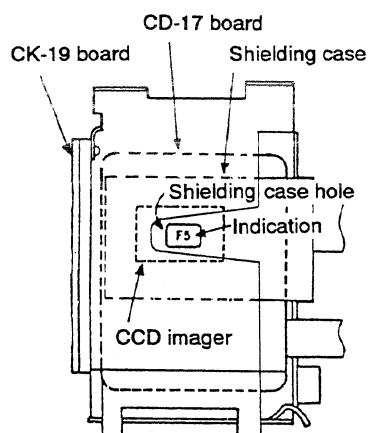
Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	31 (V SUB)
Specified Value	(Voltage indicated by the imager) $\pm$ 0.05 Vdc

Adjustment method:

- 1) Set the adjustment address to 31 using the adjustment remote controller.
- 2) Change the adjustment data using the adjustment remote controller to set the VSUB voltage (Voltage indicated by the imager) to $\pm$ 0.05 Vdc.
- 3) Change the adjustment address to store the adjustment data in the memory.

Note: The VSUB specified voltage is expressed by two digits with the integer section abbreviation and decimal section by the imager.

Integer section abbreviation	Integer value
1	1
:	:
9	9
A	10
B	11
C	12
D	13
E	14
F	15
G	16
H	17
I	18
J	19
K	20
L	21



(Example)

If F5 is indicated, the integer value is F $\rightarrow$ 15 and decimal value is 5 $\rightarrow$ 0.5. Thus, the VSUB voltage is 15 + 0.5 = 15.5 (Vdc).

Fig. 7-13.

7-2-6. Hall Adjustment (CV-8 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Element	RV801
Adjustment Address	27 (Hall Offset)
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Adjustment method:

- 1) Set the adjustment address to 37 with the adjustment remote controller, and set the adjustment data to 05. (Setting when iris closed)
- 2) Change the adjustment address to 27.
- 3) Change the adjustment data until the indication on the AF microcomputer data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
- 4) Change the adjustment address to 37 and set the adjustment data to 07. (Setting when iris open)
- 5) Adjust RV801 until the indication on the AF microcomputer data reading jig is either 3D or 3E. (3D is indicated as 3d.)
- 6) Repeat steps 1) through 5) until the specified values are satisfied.
- 7) Set the adjustment address to 37 and set the adjustment data to 00. (Releases adjustment mode)
- 8) Change the adjustment address to store the adjustment data in the memory.

7-2-7. Iris Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin (B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	25 (Iris)
Specified Value	360 ± 20 mVp-p

Adjustment method:

- 1) Set the adjustment address to 25 with the adjustment remote controller.
- 2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the CCD OUT signal level to 360 ± 20 mVp-p.
- 3) Attach the ND filter 0.5 (0.4 ± 0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
- 4) Remove the ND filter and confirm that the signal level is 360 ± 20 mVp-p.
- 5) Repeat 2) through 4) if the specified value is not met.
- 6) Change the adjustment address to store the adjustment data in the memory.

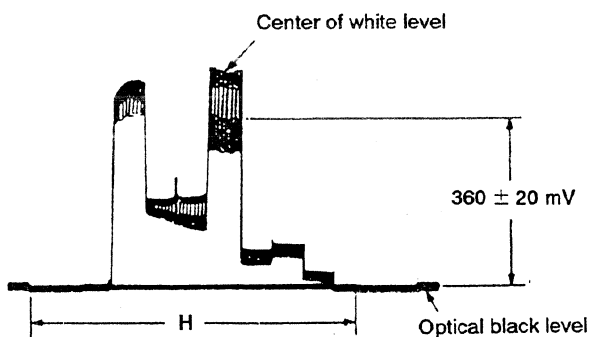


Fig. 7-14.

7-2-8. Iris In/Out Adjustment (CV-8 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	46 (hall level) 45 (hysteresis)

Adjustment method:

- 1) Cover the lens with the ND filter 0.8 ($0.4+0.4$).
- 2) Set the adjustment address to 37 with the adjustment remote controller and set the adjustment data to 09. (Hall in/out threshold mode setting)
- 3) Read the data indicated on the AF microcomputer data reading jig. This data will be a.
- 4) Change the adjustment address to 46 and enter a as the adjustment data.
- 5) Remove the ND filter 0.8 and replace it with ND filter 0.5 ($0.4+0.1$).
- 6) Read the data indicated on the AF microcomputer data reading jig. This data will be b.
- 7) Subtract data b from data a to obtain data c.

(Refer to Table 7-5. Hexadecimal-Decimal Conversion Table)

(Example)

If $a=1A$ and $b=15$, $c=a-b=1A(26) - 15(21) = 05$

() indicates decimal value

- 8) Obtain the hysteresis data from data c using the table below.

Data c	Hysteresis Data
02, 03	01
04, 05, 06	02
07, 08, 09	03

(Example)

The hysteresis data is 02 if $c=05$.

- 9) Change the adjustment address to 45 and enter the hysteresis data as the adjustment data.
- 10) Change the adjustment address to 37 and set the adjustment data to 00. (Releases hall in/out threshold mode)
- 11) Change the adjustment address to store the adjustment data in the memory.

7-2-9. AGC Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B3) (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	32 (AGC)
Specified Value	160 ± 5 mVp-p

Adjustment method:

- 1) Set the adjustment address to 32 using the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the Y (LPF) signal level to 160 ± 5 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

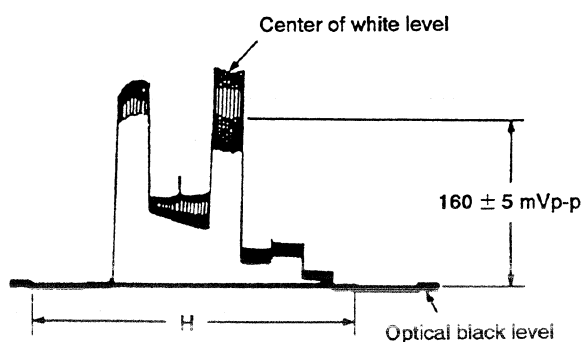


Fig. 7-15.

7-2-10. Y Signal Matrix Adjustment (CV-8 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A4) (Y0) of check point array 2: Pin (A5) (Y1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	15 (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Adjustment method:

- 1) Connect the oscilloscope to Pin (A4) of the check point array and measure the Y0 signal level.
- 2) Connect the oscilloscope to Pin (A5) of the check point array.
- 3) Set the adjustment address to 15 using the adjustment remote controller.
- 4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
- 5) Change the adjustment address to store the adjustment data in the memory.

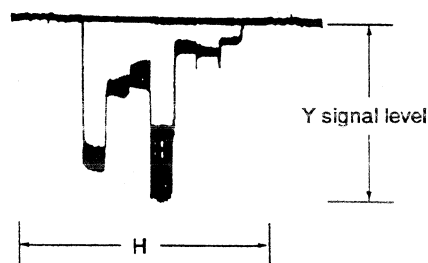


Fig. 7,16.

7-2-11. Chroma Signal Matrix Adjustment (1) (CV-8 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A6) (C0) of check point array 2: Pin (A7) (C1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Adjustment method:

- 1) Connect the oscilloscope to Pin (A6) of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
- 2) Connect the oscilloscope to Pin (A7) of the check point array.
- 3) Set the adjustment address to 14 using the adjustment remote controller.
- 4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
- 5) Change the adjustment address to store the adjustment data in the memory.



Fig. 7-17. C0 and C1 Signal Levels

7-2-12. Chroma Signal Matrix Adjustment (2) (CV-8 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): emitter of Q642 (B-Y) CH2 (Y): emitter of Q614 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	13 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: video output terminal)

Adjustment method:

- 1) Set the adjustment address to 13 using the adjustment remote controller.
- 2) Change the adjustment data so that the two separate color luminance points become one respectively.
- 3) Change the adjustment address to store the adjustment data in the memory.

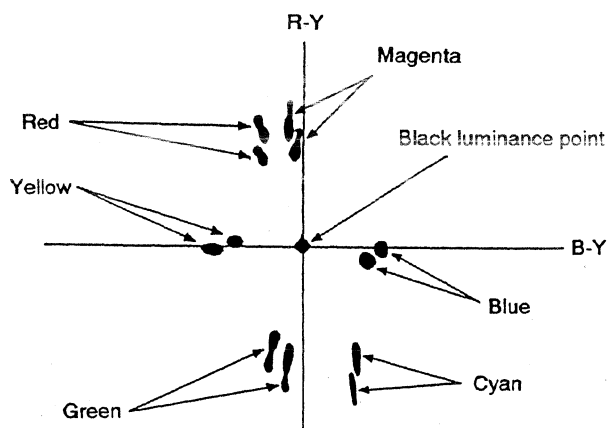


Fig. 7-18.

7-2-13. YH Level Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (Y GAIN)
Specified Value	900 ± 40 mVp-p

Adjustment method:

- 1) Set the adjustment address to 10 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the YH signal level to 900 ± 40 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

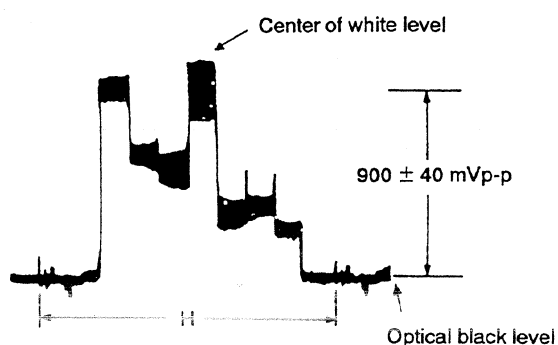


Fig. 7-19.

7-2-14. Sync Level Adjustment (CV-8 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	20 (SYNC LEVEL)
Specified Value	140 ± 5 mVp-p

Adjustment method:

- 1) Set the adjustment address to 20 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the sync level to 140 ± 5 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

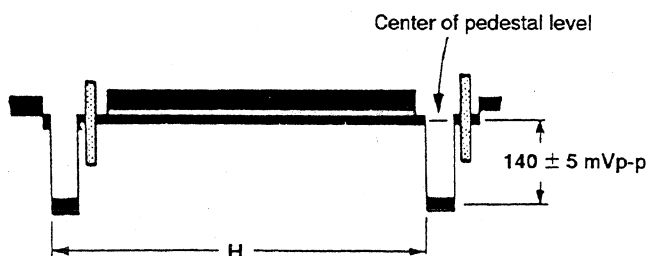


Fig. 7-20.

7-2-15. Setup Adjustment (CV-8 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (SET UP)
Specified Value	20 ± 5 mV

Note: 1) and 2) are steps taken to reduce noise.

Adjustment method:

- 1) Set the address to 21 (APERTURE) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this at address.
- 2) Set the address to 28 (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
- 3) Set the adjustment address to 19 with the adjustment remote controller.
- 4) Change the adjustment data with the adjustment remote controller to set the setup level to 20 ± 5 mV.
- 5) Set the adjustment address to 21 and enter the adjustment data recorded in 1).
- 6) Set the adjustment address to 28 and enter the adjustment data recorded in 2).
- 7) Change the adjustment address to store the adjustment data in the memory.

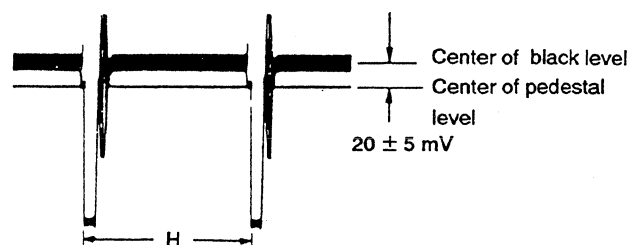


Fig. 7-21.

7-2-16. Y Level Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	18 (Y LEVEL)
Specified Value	$330 \pm 10 \text{ mV}$

Adjustment method:

- 1) Set the adjustment address to 17 with the adjustment remote controller, and make a note of the adjustment data for this address.
- 2) Set the adjustment data to FF with the adjustment remote controller.
- 3) Set the adjustment address to 18 with the adjustment remote controller.
- 4) Change the adjustment data with the adjustment remote controller to set the Y signal level to $330 \pm 10 \text{ mV}$.
- 5) Set the adjustment address to 17 and enter the adjustment data recorded in 1).
- 6) Change the adjustment address to store the adjustment data in the memory.

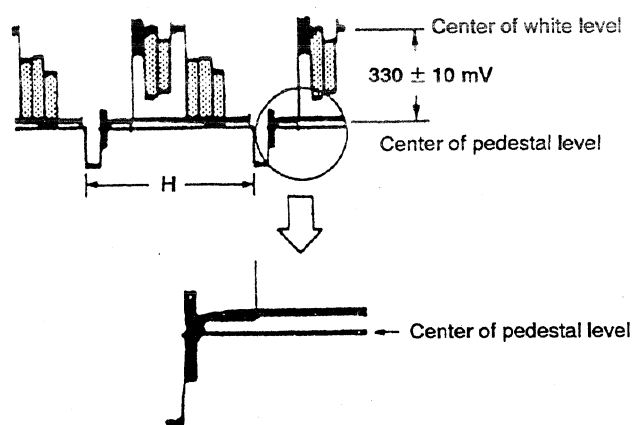


Fig. 7-22.

7-2-17. White Clip Adjustment (CV-8 Board)

Subject	High luminance pattern
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	17 (WHITE CLIP)
Specified Value	$420 \pm 10 \text{ mV}$

Adjustment method:

- 1) Set the adjustment address to 18 with the adjustment remote controller, and make a note of the adjustment data for this address.
- 2) Set the adjustment data to 40 with the adjustment remote controller.
- 3) Set the adjustment address to 17 with the adjustment remote controller.
- 4) Change the adjustment data with the adjustment remote controller to set the white clip level to $420 \pm 10 \text{ mV}$.
- 5) Set the adjustment address to 18 and enter the adjustment data recorded in 1).
- 6) Change the adjustment address to store the adjustment data in the memory.

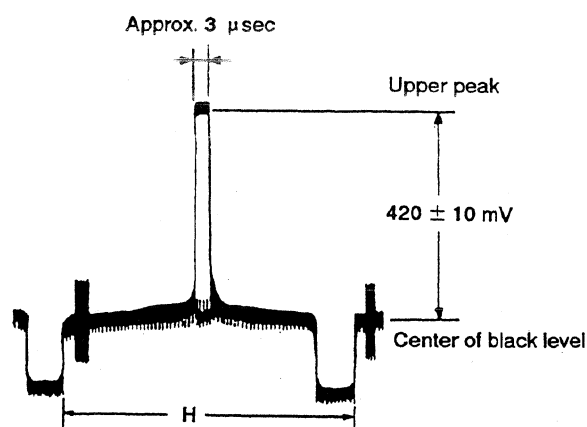


Fig. 7-23.

7-2-18. Aperture Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Emitter of Q602
Measuring Instrument	Oscilloscope
Adjustment Address	21 (APERTURE)
Specified Value	40 ± 5 mV

Adjustment method:

- 1) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
- 2) Change the adjustment data to set the lower peak between green and white to 40 ± 5 mV.
- 3) Change the adjustment address to store the adjustment data in the memory.

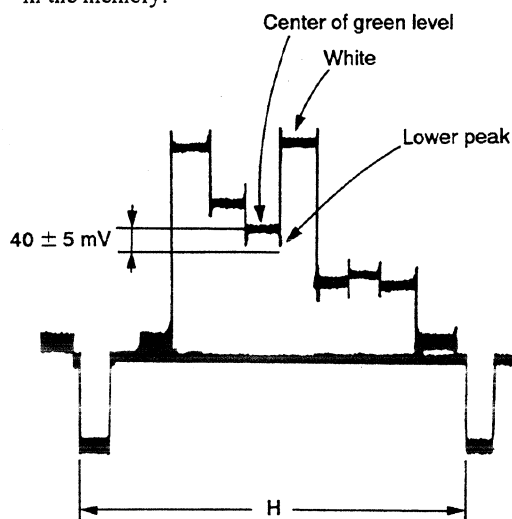


Fig. 7-24.

7-2-19. Max. Gain Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two) and 0.4 (one)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	28 (MAX GAIN)
Specified Value	170 ± 10 mV

Adjustment method:

- 1) Cover the lens with the ND filter 2.4 (1.0 + 1.0 + 0.4).
- 2) Set the adjustment address to 28 with the adjustment remote controller.
- 3) Change the adjustment data with the adjustment remote controller to set the Y signal level to 170 ± 10 mV.
- 4) Change the adjustment address to store the adjustment data in the memory.

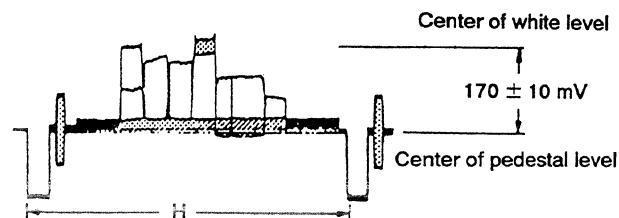


Fig. 7-25.

7-2-20. Chroma Level Adjustment (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	400 ± 20 mVp-p

Connections:

- 1) Connect Pin (B7) (MODE) of the check point array to GND using a jumper wire.

Adjustment method:

- 1) Set the adjustment address to 09 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the G OUT signal level to 400 ± 20 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

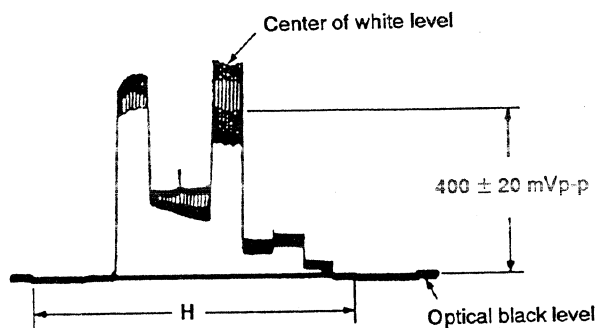


Fig. 7-26.

7-2-21. Burst Level Adjustment (CV-8 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	22 (BURST LEVEL)
Specified Value	140 ± 5 mVp-p

Adjustment method:

- 1) Set the adjustment address to 22 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to set the burst level to 140 ± 5 mVp-p.
- 3) Change the adjustment address to store the adjustment data in the memory.

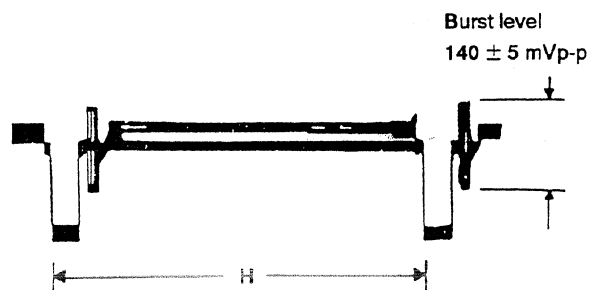


Fig. 7-27.

7-2-22. Indoor White Balance Adjustment (Method using vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminals
Measuring Instrument	Vectorscope
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	The white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjustment method:

- 1) Set the adjustment address to 11 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to move the white luminance point to the origin point.
- 3) Set the adjustment address to 12.
- 4) Change the adjustment data to move the white luminance point to the origin point.
- 5) Repeat steps 1) through 4).
- 6) Change the adjustment address to store the adjustment data in the memory.

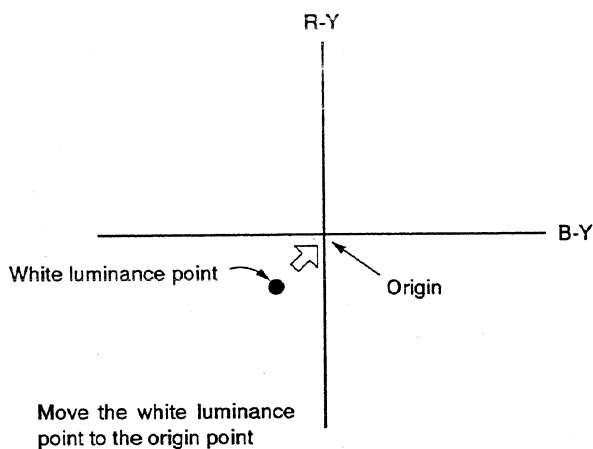


Fig. 7-28.

7-2-23. Indoor White Balance Adjustment (Method using oscilloscope) (CV-8 Board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q642 (B-Y) CH2 (Y): emitter of Q614 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	11 (R GAIN) 12 (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjustment method:

- 1) Set the adjustment address to 11 with the adjustment remote controller.
- 2) Change the adjustment data with the adjustment remote controller to move the white luminance point to the black luminance point.
- 3) Set the adjustment address to 12.
- 4) Change the adjustment data to move the white luminance point to the black luminance point.
- 5) Repeat steps 1) through 4).
- 6) Change the adjustment address to store the adjustment data in the memory.

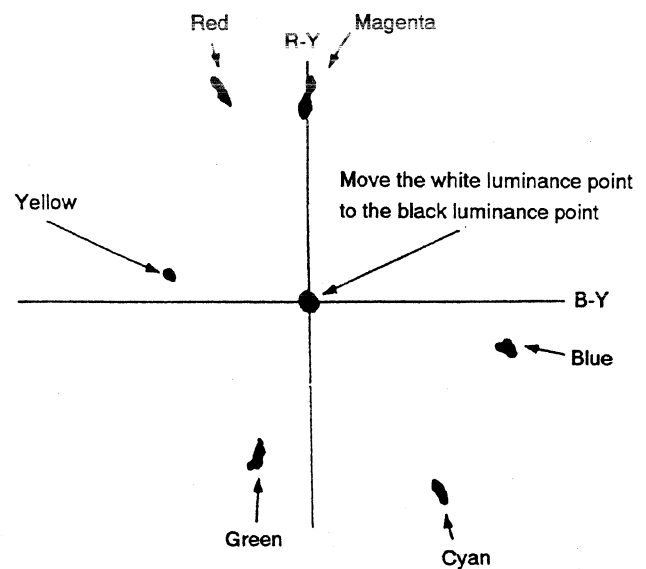


Fig. 7-29.

7-2-24. Color Reproduction Adjustment (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminals
Measuring Instrument	Vectorscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN) 07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that Burst Level Adjustment and Indoor White Balance Adjustment have been completed.

Adjustment method:

- 1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
- 2) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame.
- 3) Change the adjustment address to store the adjustment data in the memory.

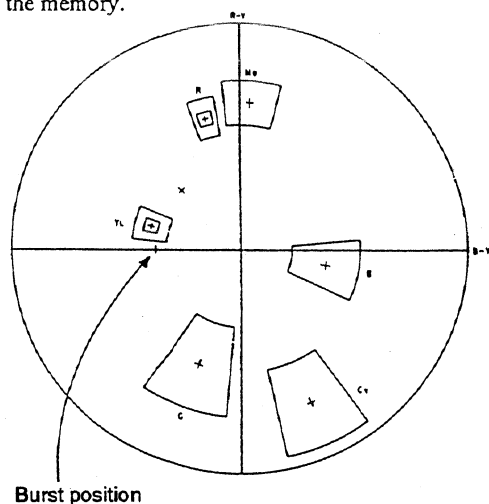


Fig. 7-30.

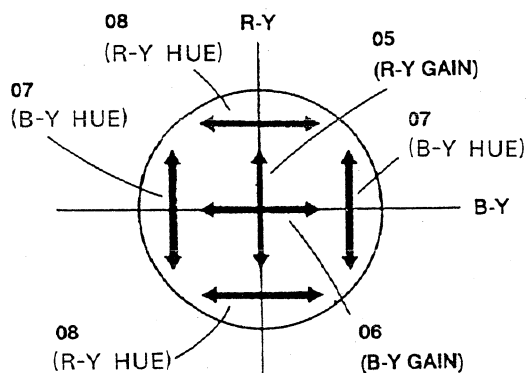


Fig. 7-31. Adjustment Address and Direction of Luminance Point Movement

7-2-25. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (CV-8 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (B8) (VIDEO OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R-Y GAIN) 06 (B-Y GAIN)
Specified Value	Red level: 227 ± 15 mVp-p Yellow level: 151 ± 12 mVp-p

Note: Confirm that Indoor White Balance Adjustment has been completed.

Adjustment method:

- 1) Set the adjustment address to 06 with the adjustment remote controller and set the adjustment data to B0.
- 2) Set the adjustment address to 07 and set the adjustment data to B0.
- 3) Set the adjustment address to 08 and set the adjustment data to B0.
- 4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal red level to 227 ± 15 mVp-p.
- 5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal yellow level to 151 ± 12 mVp-p.
- 6) Repeat steps 4) and 5).
- 7) Change the adjustment address to store the adjustment data in the memory.
- 8) Perform Hue Adjustment.

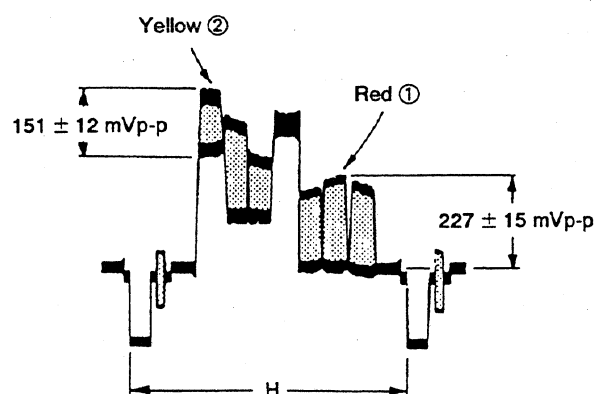


Fig. 7-32.

2. Hue adjustment

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q642 (B-Y) CH2 (Y): emitter of Q614 (R-Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (B-Y HUE) 08 (R-Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that Indoor White Balance Adjustment has been completed.

Adjustment method:

- 1) Move the black luminance point on the oscilloscope to the origin point of the color reproduction frame.
- 2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
- 3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary.
- 4) Change the adjustment address to store the adjustment data in the memory

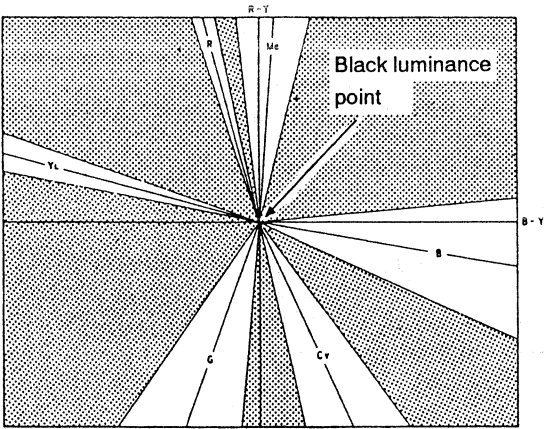


Fig. 7-33.

7-2-26. Auto White Balance Adjustment

Note: Be sure to first perform Preset Adjustment followed by Auto White Balance Adjustment.

1. Preset adjustment (CV-8 Board)

Subject	1. Color bar standard picture frame 2. White pattern standard picture frame
Measurement Point	Pin (B3) (Y LPF OUT) of check point array
Measuring Instrument	Oscilloscope

- Note:** 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, repeat after first turning the power off and then back on.

Preparations:

- 1) Prepare a 1 kΩ resistor for connecting Pin (B5) (AWB ADJ) of the check point array and Pin ④ (CAM 5V) of W902.

Adjustment method:

- 1) Turn the power OFF and then ON.
- 2) Set the subject to the color bar chart standard picture frame.
- 3) Select adjustment address 32 (AGC) with the adjustment remote controller and make a note of the adjustment data at this address.
- 4) Change the adjustment data with the adjustment remote controller to set the signal level to 220 ± 10 mV.
- 5) Change the subject to the white pattern standard picture frame.
- 6) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0.
- 7) Change the adjustment address to store the adjustment data in the memory. Wait at least five seconds.
- 8) Remove the jumper wire between Pin (B6) (CAM ADJ) of the check point array and GND.
- 9) Connect Pin (B5) (AWB ADJ) of the check point array and Pin ④ of W902 (CAM 5V) with a 1 kΩ resistor.
- 10) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire. Confirm that the indication (adjustment address 01) of the adjustment remote controller is changed.
- 11) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array after allowing one second or more to elapse.
- 12) Remove the 1 kΩ resistor connected to Pin (B5) (AWB ADJ) of the check point array.
- 13) Connect Pin (B6) (CAM ADJ) of the check point array to GND using a jumper wire.
- 14) Select adjustment address 32 using the adjustment remote controller and enter the adjustment data recorded in 3).
- 15) Change the adjustment address to store the adjustment data in the memory.

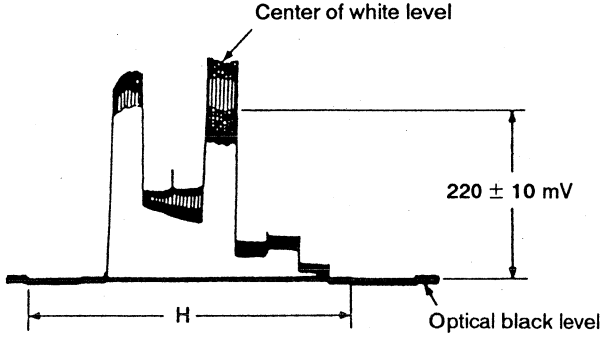


Fig. 7-34.

2. Auto White Balance Adjustment (CV-8 Board)

Note: Be sure to perform this adjustment after completing Preset Adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 (C12+C2) for black temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)
Measurement Point	CH1 (X): emitter of Q642 (B-Y) CH2 (Y): emitter of Q614 (R-Y)
Adjustment Address	01 (DELTA R) 02 (DELTA B) 80 (R OUTDOOR) 81 (B OUTDOOR) 77 (B UP LIMIT) 79 (B OUT LIMIT) 65 (TOP SLP R) 66 (TOP SLP R) 73 (TOP UP) 74 (TOP DWN) 78 (R OUT LMT)
Specified Value	Line up the white luminance point with the black luminance point.

- Note:** 1) Make connection to the video output terminals when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjustment method:

- 1) Select adjustment address 89 (AWB MODE) with the adjustment remote controller and enter adjustment data of 10. And cover the lens with the filter C14.
- 2) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote controller to move the white luminance point to the black luminance point. (Move the white luminance point to the origin point when using the vectorscope.) The adjustment data of adjustment address 01 is D1 and the adjustment data of adjustment address 02 is D2.

- 3) Select adjustment address 80 and enter adjustment data D1+1. Select adjustment address 81 and enter adjustment data D2+3. (Outdoor white balance adjustment.)
- 4) Convert adjustment data D1 to decimal to obtain D1'. Convert adjustment data D2 to decimal to obtain D2'. (See Table 7-5 Hexadecimal-Decimal Conversion Table)
- 5) Obtain D77' by the following formula.
 $D77' = (D2' \times 1.9) - 43.2$
- 6) Convert D77' to hexadecimal and call this value D77. (Round off the decimal portion)
- 7) Select adjustment address 77 with the adjustment remote controller and enter adjustment data D77. Enter adjustment data D1 to adjustment address 78.
- 8) Obtain D79' by the following formula.
 $D79' = D2' + 10$
- 9) Convert D79' to hexadecimal and call this value D79.
- 10) Select adjustment address 79 with the adjustment remote controller and enter adjustment data D79.
- 11) Obtain d' by the following formula.
 $d' = (D1' \times 5) + D2'$
The adjustment procedure in 12) through 14) varies according to the value of d'.

[d' > 308]

- 12) Obtain D73' and D74' by the following formulas.
 $D73' = (D1' \times 3) + (D2' \div 2) + 30$
 $D74' = D73' - 42$
- 13) Convert D73' and D74' to hexadecimal and call these values D73 and D74. (Round off the decimal portion)
- 14) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	01
73	D73
74	D74

Perform the adjustment steps beginning from 15).

[308 ≥ d' ≥ 286]

- 12) Obtain D73' and D74' by the following formulas.
 $D73' = (d' \div 2) + 25$
 $D74' = D73' - 39$
- 13) Convert D73' and D74' to hexadecimal and call these values D73 and D74. (Round off the decimal portion)
- 14) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	41
66	01
73	D73
74	D74

Perform the adjustment steps beginning from 15).

[286 > d']

- 12) Obtain D73' and D74' by the following formulas.
 $D73' = (D1' \times 3) + D2' + 30$
 $D74' = D73' - 42$
- 13) Convert D73' and D74' to hexadecimal and call these values D73 and D74. (Round off the decimal portion)
- 14) Use the adjustment remote controller to enter the adjustment data shown in the table below for the indicated adjustment addresses.

Adjustment address	Adjustment data
65	20
66	00
73	D73
74	D74

- 15) Select adjustment address 89 and enter adjustment data F0.
- 16) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote commander to move the white luminance point and black luminance point.
(Move the white luminance point to the origin point when using the vectorscope.)
- 17) Select adjustment address 89 and enter adjustment data of 00.
- 18) Remove the filter C14.
- 19) Change the adjustment address to store the adjustment data in the memory.

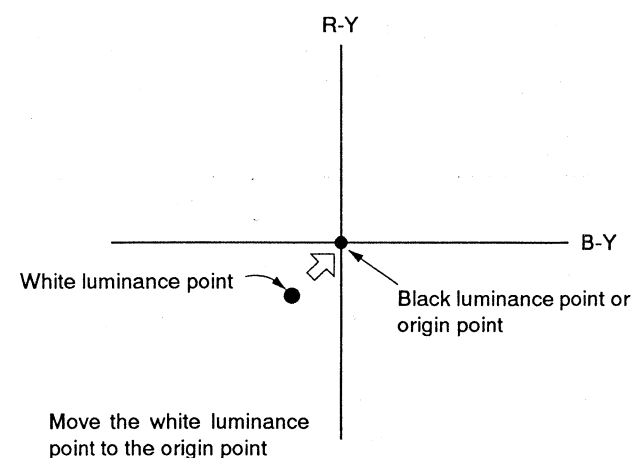


Fig. 7-35.

(Example)

When the adjustment data obtained in Step 2) has the following values.

Adjustment address	Adjustment data
01	2A
02	53

→ Entered into adjustment address 78

D1=2A and D2=53 when there is conversion to decimal using Table 7-5.

D1'=42

D2'=83

Thus,

$D80' = 42 + 1 = 43$

$D81' = 83 + 3 = 86$

$D77' = (83 \times 1.9) - 43.2 = 114.5$

Rounding off the decimal portion and converting to hexadecimal by Table 7-5 results in,

D80=2B → Entered into adjustment address 80.

D81=56 → Entered into adjustment address 81.

D77=72 → Entered into adjustment address 77.

In the same manner,

$D79' = (83 + 10) = 93$

D79=5D → Entered into adjustment address 79

In addition,

$d' = (42 \times 5) + 83 = 293$

Thus, $[308 \geq d' \geq 286]$

$D73' = (293 \div 2) + 25 = 171.5$

∴ D73=AC → Entered into adjustment address 73

$D74' = 171.5 - 39 = 132.5$

∴ D74=85 → Entered into adjustment address 74

Also, adjustment data of 41 is entered into adjustment address 65, and adjustment data of 01 is entered into adjustment address 66. The steps beginning from 15) are then performed.

7-2-27. Outdoor White Balance Confirmation

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: video output terminals When oscilloscope used: CH1 (X): emitter of Q642 (B-Y) CH2 (Y): emitter of Q614 (R-Y)
Measuring Instrument	
Specified Value	See Fig. 7-36.

Connections:

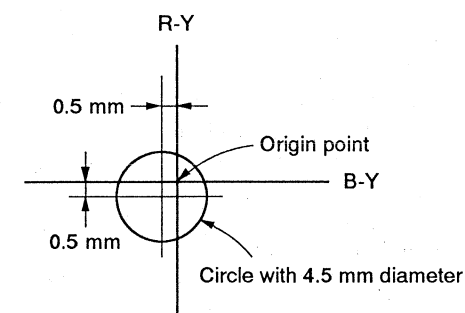
- 1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array. (Turns off the EVR adjustment mode)

Checking method:

- 1) Press the white balance button to select the outdoor white balance mode. (* mark is displayed on EVF screen or monitor TV screen (when data screen ON).)
- 2) Confirm that the center of the white luminance point is within the circle shown in the figure below.

Note: When using a vectorscope, adjust the GAIN and PHASE of the vectorscope so that burst luminance point move to with the burst position of the color reproduction frame.

(When using vectorscope)



(When using oscilloscope)

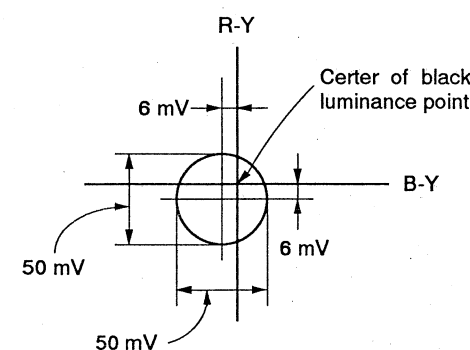


Fig. 7-36.

7-2-28. Focus Motor Speed Adjustment (CV-8 Board)

Subject	Arbitrary
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	A26 (FOCUS SPEED)
Specified Value	Average value of data indicated on jig=4.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 2.1 seconds after completion of adjustment.

Adjustment method:

- 1) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of 01. (Sets hunching mode)
- 2) Set the adjustment address to 26.
- 3) Change the adjustment data so that the indication on the AF microcomputer data reading jig is 04 while the ring is rotating.
- 4) Press the HOLD button of the AF microcomputer data reading jig while the focus ring is rotating to read the indication value.
- 5) Repeat step 4) ten times and obtain the average value.
Specified value=4.0 ± 0.5
Repeat steps 3) and 4) if the specified value is not satisfied.
- 6) Set the adjustment address to 37 and set the adjustment data to 00. (Releases hunching mode)
- 7) Change the adjustment address to store the adjustment data in the memory.

7-2-29. Macro Area Adjustment (CV-8 Board)

Subject	Arbitrary
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	39 (MACRO)
Specified Value	(Value at zoom ring WIDE position) +2

Adjustment method:

- 1) Set the zoom ring to the WIDE position (8.5 mm position).
- 2) Select adjustment address 37 with the adjustment remote controller and set the adjustment data to 03. (Sets zoom position indication mode)
- 3) Read the data indicated on the AF microcomputer data reading jig. (Data in the range of 00 to 0C is displayed if normal.)
- 4) Change the adjustment address to 39.
- 5) Add 2 to the data read from the jig and enter as the adjustment data. (See Table 7-5. Hexadecimal-Decimal Conversion Table)
- 6) Change the adjustment address to 37 and set the adjustment data to 00. (Releases zoom position indication mode)
- 7) Change the adjustment address to store the adjustment data in the memory.

7-2-30. Auto-Focus LLA Adjustment (CV-8 Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	38 (LLA)
Specified Value	(Value indicated on jig) -2

Adjustment method:

- 1) Select adjustment address 37 with the adjustment remote controller and set to 0B as the adjustment data. (Sets auto-focus LLA adjustment mode)
- 2) Read the data indicated on the AF microcomputer data reading jig and call this value D.
- 3) Subtract 2 from D and make this value the LLA data.
(See Table 7-5. Hexadecimal-Decimal Conversion Table)

(Example)

When D=30 (48), LLA data is 2D (46)

When D=31 (49), LLA data is 2F (47)

() is decimal equivalent

- 4) Select adjustment address 38 with the adjustment remote controller and enter the LLA data as the adjustment data.
- 5) Select adjustment address 37 and set 00 as the adjustment data. (Releases auto-focus LLA adjustment mode)
- 6) Change the adjustment address to store the adjustment data in the memory.

7-2-31. Auto-Focus Adjustment

1. Adjustment in all black pattern (CV-8 board)

Subject	All black (cover lens with black cap)
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	42 (BASE-H)

Adjustment method:

- 1) Turn off the auto-focus with the FOCUS button (S655 on CK-19 board).
- 2) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of FF.
- 3) Read the indication on the AF microcomputer data reading jig and confirm this value (FHB). (FHB should be 00 to 07.)
- 4) Obtain adjustment data D42 according to the following formulas.
When FHB=0
 $D42=03$
When FHB > 0
 $D42=FHB+2$ * Hexadecimal calculations
- 5) Select adjustment address 42 with the adjustment remote controller and enter D42 as the adjustment data.
- 6) Select adjustment address 37 and enter adjustment data of 00.
- 7) Change the adjustment address to store the adjustment data in the memory.
- 8) Perform "Adjustment in white pattern".

2. Adjustment in white pattern (CV-8 board)

Subject	White pattern standard picture frame (Position 1.5 m from the front of the lens reference plane (Φ mark))
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	41 (LOW CONT)

Measurement method:

- 1) Confirm that the white pattern is not soiled.
- 2) Confirm that the auto-focus is turned off.
- 3) Select adjustment address 37 with the adjustment remote controller and enter adjustment data of FD.
- 4) Read the indication of the AF microcomputer data reading jig and confirm this value (FAW). (FAW should be 00 to 03)
- 5) Obtain adjustment data D41 according to the following formulas.
 $D41=FAW+3$
- 6) Select adjustment address 41 with the adjustment remote controller and enter D41 as the adjustment data.
- 7) Select adjustment address 37 and enter adjustment data of 00.
- 8) Change the adjustment address to store the adjustment data.
- 9) Perform "Adjustment in Siemens star"

3. Adjustment in Siemens star (CV-8 board)

Subject	Siemens Star (1.5m in front of the lens reference surface (Φ mark))
Measurement Point	CN803
Measuring Instrument	AF microcomputer data reading jig
Adjustment Address	49 (KATAMUKI)

Measurement method:

- 1) Place the Siemens Star 1.5m in front of the lens reference surface (see Fig. 7-2).
- 2) Set the zoom lever to the TELE end (68 mm) and turn auto-focus off with the FOCUS button (S655 on the CK-8 board).
- 3) Adjust camera position so that the center of the Siemens Star displayed on the monitor coincides with the center of the monitor screen.

Illumination Adjustment:

- 1) Select adjustment address 37 and input adjustment data 09 with the adjustment remote controller (this will cause iris condition to be displayed on the AF microcomputer data reading jig (henceforth referred to as AF jig)).
- 2) Put a black cap on the lens and read the AF jig indication (value for fully-open iris).
- 3) Remove the black cap and confirm that the AF jig indication drops below the fully-open value (in case the iris remains fully open, increase Siemens Star illumination).
- 4) Lower Siemens Star illumination gradually (if using ND filters, gradually increase the ND value). Stop when the AF jig indication reaches the fully-open iris value-2 from the fully-open iris value. (Confirm that the screen does not get dark.)

Auto-focus Adjustment:

- 1) Set the focus ring to the close-range end (1.3m) and the zoom lever to the TELE end (68 mm), then turn auto-focus on with the FOCUS button.
- 2) After 2.0 seconds, confirm that the Siemens Star is being clearly reproduced, then press the FOCUS button to turn auto-focus off.
- 3) Select adjustment address 37 and input adjustment data FF with the adjustment remote controller (the auto-focus filter will be set to the FH side).
- 4) Read the AF jig indication, and call the data FHSM, and then convert it to the decimal number FHSM'. (FHSM' shall be within 16 to 55)
- 5) Select adjustment address 37 and input adjustment data FD with the adjustment remote controller (the auto-focus will be set to the FA side).
- 6) Read the AF jig indication, and call the data FASM, and then convert it to the decimal number FASM'. (FASM' shall be within 78 to 104)

- 7) Obtain D49' by the following formula:

$$D49' = \frac{FHSM' - FHB - 4}{FASM' - 40} \times 16$$

- FH-B is the adjustment data for the all-black pattern.

- 8) Convert D49' to the hexadecimal number D49 (Round off the decimal portion.).
- 9) Select adjustment address 49 and input adjustment data D49.
- 10) Select adjustment address 37 and input adjustment data 00.
- 11) Change the adjustment address to store the adjustment data.

7-2-32. Auto-Focus Confirmation

Subject	Siemens star (position 1.5m from the front of the lens reference plane (" Φ " mark))
---------	---

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Measuring method:

- 1) Place the Siemens star 1.5m from the front of the lens reference surface (See Fig. 7-2.).
- 2) Set the zoom lever to the TELE position (68 mm) and turn on auto focus with the FOCUS button.
- 3) Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
- 4) To open the iris, reduce the illumination of the Siemens star to the range in which the $\blacksquare$ mark in the upper center of the EVF screen does not light up.
(Or cover lens with the ND filter)
- 5) Turn off the auto-focus with the FOCUS button.
- 6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-37 at this time.
Perform Flange Back Adjustment if this condition is not satisfied.
- 7) Rotate the focus ring to the close extreme (1.3m).
- 8) Turn on the auto-focus with the FOCUS button.
- 9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
- 10) Turn off the auto-focus and rotate the focus to the far extreme (∞).
- 11) Turn on the auto-focus.
- 12) Confirm that there is focusing within three seconds and a sharp image can be obtained.

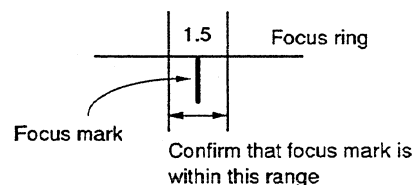


Fig. 7-37.

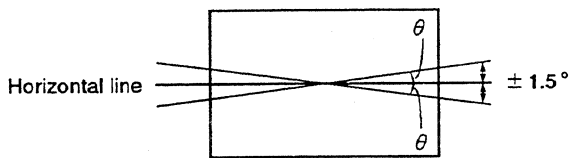
7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE A) (VF-14 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-38.

Adjustment method:

- 1) By turning RV904 (BRIGHT), adjust for a luminance level which provides appropriate visibility of the CRT screen.
- 2) Loosen the DY (deflection yoke) tightening nut.
- 3) Make the image horizontal by rotating DY.
- 4) Retighten the DY tightening nut. (Do not tighten excessively.)



Specified value: Image orientation within $\pm 1.5^\circ$ of horizontal line.

Fig. 7-38.

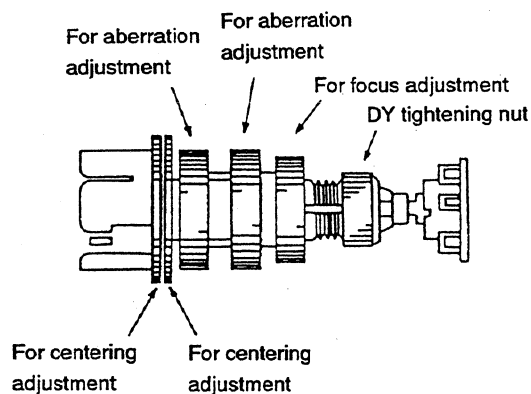


Fig. 7-39.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-40.

Adjustment method:

- 1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-40.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

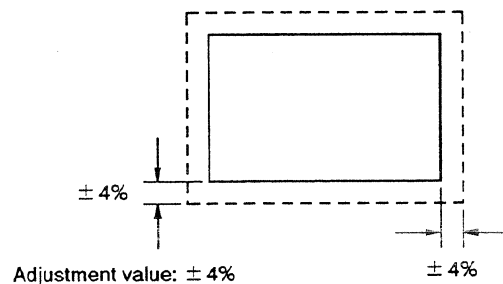


Fig. 7-40.

7-3-3. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion

Adjustment method:

- 1) Adjust for optimum focus using the focus ring.
(See Fig. 7-39.)

7-3-4. Aberration Adjustment

Mode	E-E
Signal	Dot pattern
Specified Value	See Fig. 7-41.

Adjustment method:

- 1) Use the aberration adjustment rings to adjust any trailing dots to within 2 times the dot diameter and any fan shaped aberrations to within the dot diameter.
- 2) If off center, repeat the Centering Adjustment.

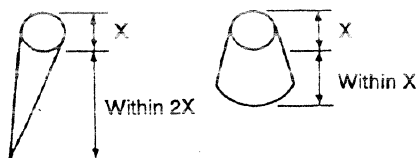


Fig. 7-41.

7-3-5. Horizontal Oscillation Frequency Adjustment (VF-14 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP)
Measurement Point	Positive terminal of C904
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV901
Specified Value	2.60 ± 0.05 Vdc

Adjustment method:

- 1) Adjust to 2.60 ± 0.05 Vdc using RV901.

7-3-6. Horizontal Amplitude Adjustment (VF-14 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C911
Specified Value	$6 \pm 3\%$

Adjustment method:

- 1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV902.
- 2) Rotate RV904 to set the brightness to the normal level.
- 3) Short or open the pattern (A) of the H size adjustment capacitor (C911) to provide horizontal overscans of $6 \pm 3\%$ (total of left and right).
(See Fig. 7-48.)

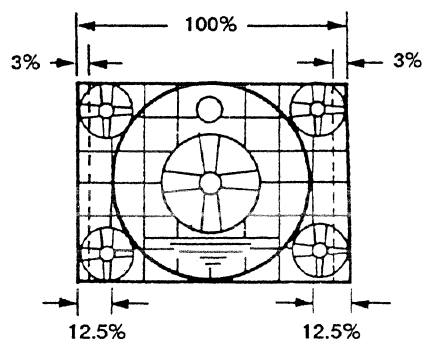


Fig. 7-42.

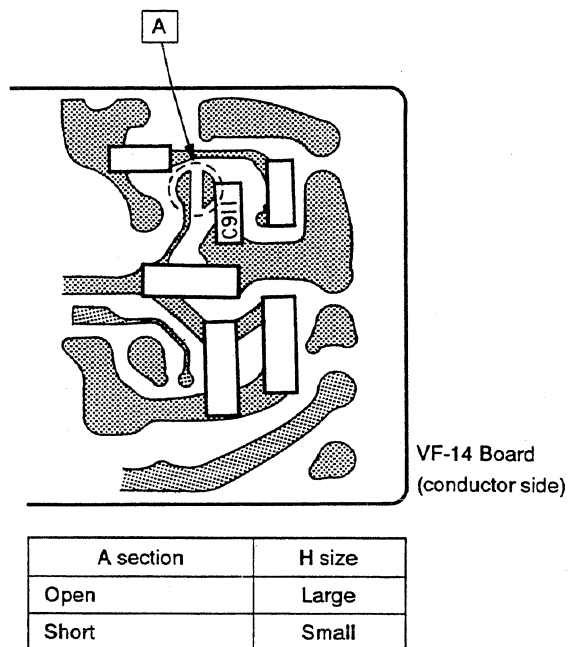


Fig. 7-43.

7-3-7. Vertical Amplitude Adjustment (VF-14 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV902
Specified Value	$5 \pm 3\%$

Adjustment method:

- 1) By turning RV902, adjust vertical overscan to $5 \pm 3\%$ (upper and lower total).

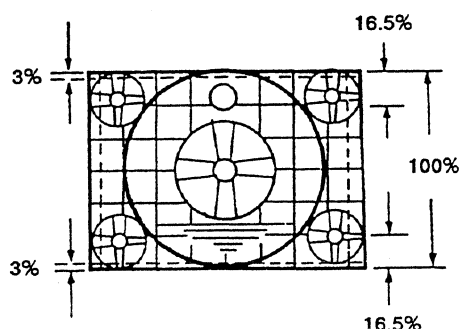


Fig. 7-44.

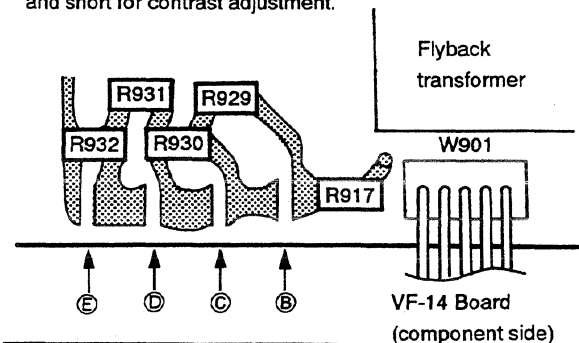
7-3-8. Brightness, Contrast Adjustments (VF-14 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: RV904 Contrast: see Fig. 7-45.

Adjustment method:

- 1) Perform brightness and contrast adjustments alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

Use sections ⑥ to ④ of VF-14 board to open and short for contrast adjustment.



Sections to be shorted	Contrast
⑤ and ⑥	High
⑥	
⑤	
All open	
④	
③	
② and ③	Low

Fig. 7-45.

7-3-9. Horizontal Amplitude, Vertical Amplitude and Focus Checks

Values should conform to specifications given in 7-3-6. Horizontal Amplitude Adjustment and 7-3-7. Vertical Amplitude Adjustment. If not, readjust accordingly, and repeat 7-3-8. Brightness, Contrast Adjustments. In this case, focus needs to be checked. If the image is not clear, perform 7-3-3. Focus Adjustment and 7-3-4. Aberration Adjustment.

7-4. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (TYPE B) (VF-22 BOARD)

7-4-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-47.

Adjustment method:

- 1) Adjust the volume array ① (BRIGHT) for appropriate brightness on CRT screen. (See Fig. 7-48.)
- 2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-46.)
- 3) Make a picture horizontal by turning the DY.
- 4) Retighten the nut. (Do not tighten excessively.)

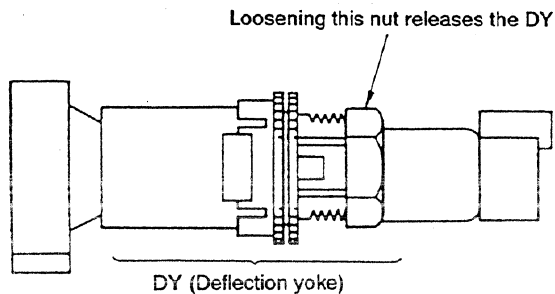
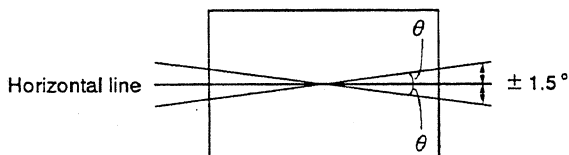


Fig. 7-46.



Specified value: Image orientation within $\pm 1.5^\circ$ of horizontal line.

Fig. 7-47.

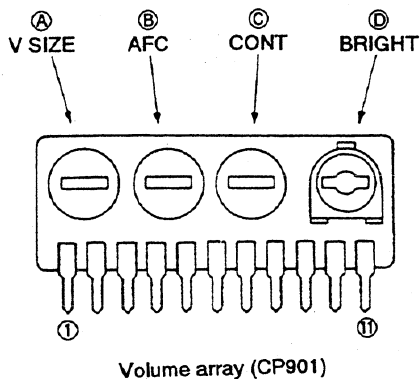


Fig. 7-48.

7-4-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-50.

Adjustment method:

- 1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-49.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

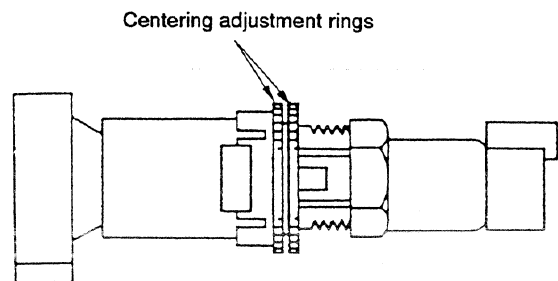


Fig. 7-49.

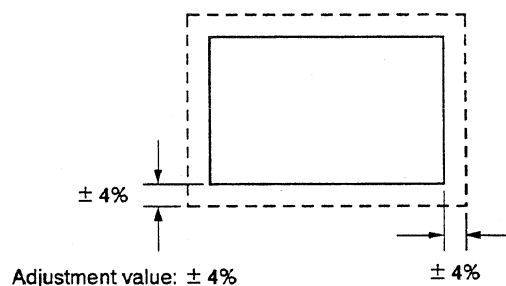


Fig. 7-50.

7-4-3. AFC Adjustment (VF-22 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C915 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	Volume array ② (AFC)
Specified Value	2.6 ± 0.2 Vdc

Adjustment method:

- 1) Adjust volume array ② (AFC) for 2.6 ± 0.2 Vdc. (See Fig. 7-48.)

7-4-4. Horizontal Amplitude Adjustment (VF-22 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C905
Specified Value	$6 \pm 3\%$

Adjustment method:

- 1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating volume array ④ (V SIZE). (See Fig. 7-48.)
- 2) Rotate volume array ⑤ (BRIGHT) to set the brightness to the normal level.
- 3) Short or open the pattern [A] of the H size adjustment capacitor (C905) to provide horizontal overscans of $6 \pm 3\%$ (total of left and right). (See Fig. 7-52.)

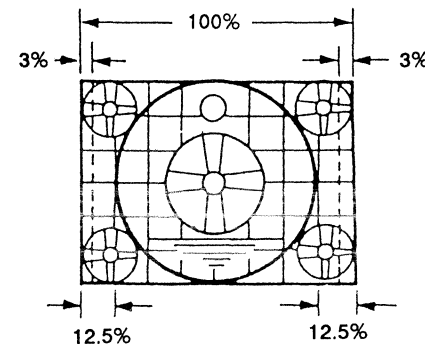
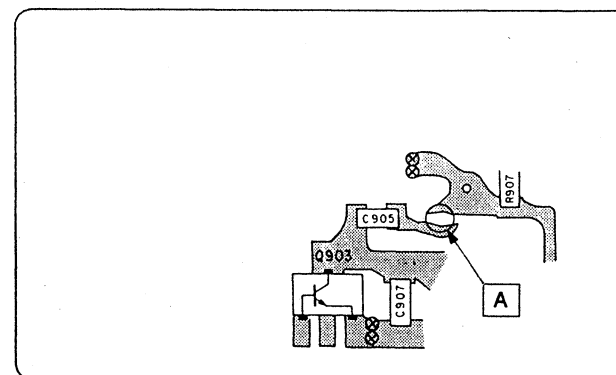


Fig. 7-51.



VF-22 Board (conductor side)

A section	H size
Open	Large
Short	Small

Fig. 7-52.

7-4-5. Vertical Amplitude Adjustment (VF-22 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Volume array ④ (V SIZE)
Specified Value	$5 \pm 3\%$

Adjustment method:

- 1) By turning volume array ④ (V SIZE), adjust vertical overscan to $5 \pm 3\%$ (upper and lower total). (See Fig. 7-48.)

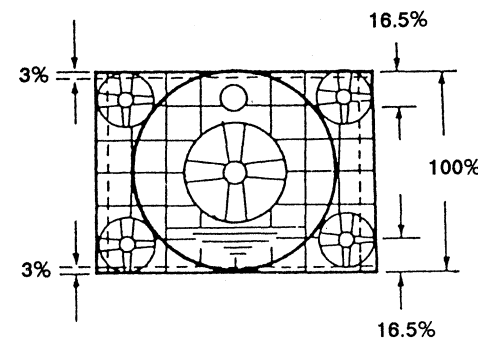


Fig. 7-53.

7-4-6. Focus Adjustment (VF-22 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV901

Adjustment method:

- 1) Adjust to the best focus point with RV901.

7-4-7. Brightness, Contrast Adjustments (VF-22 Board)

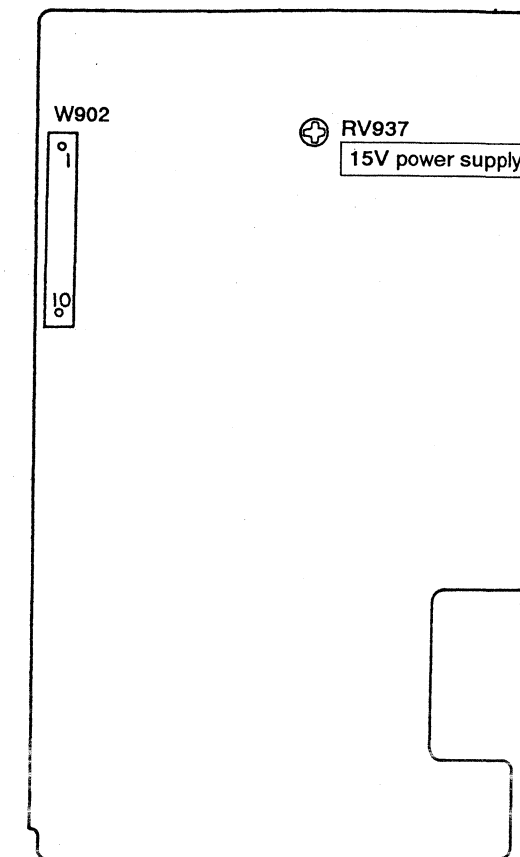
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: Volume array ⑤ (BRIGHT) Contrast: Volume array ⑥ (CONT)

Adjustment method:

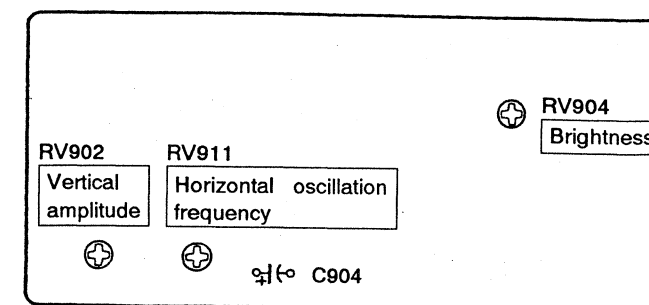
- 1) Adjust volume array ⑤ (BRIGHT) and ⑥ (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.) (See Fig. 7-48.)

7-5. ADJUSTMENT ELEMENTS LOCATION

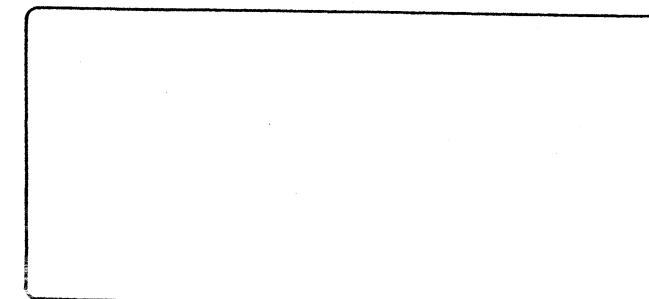
PS-225 BOARD (COMPONENT SIDE)



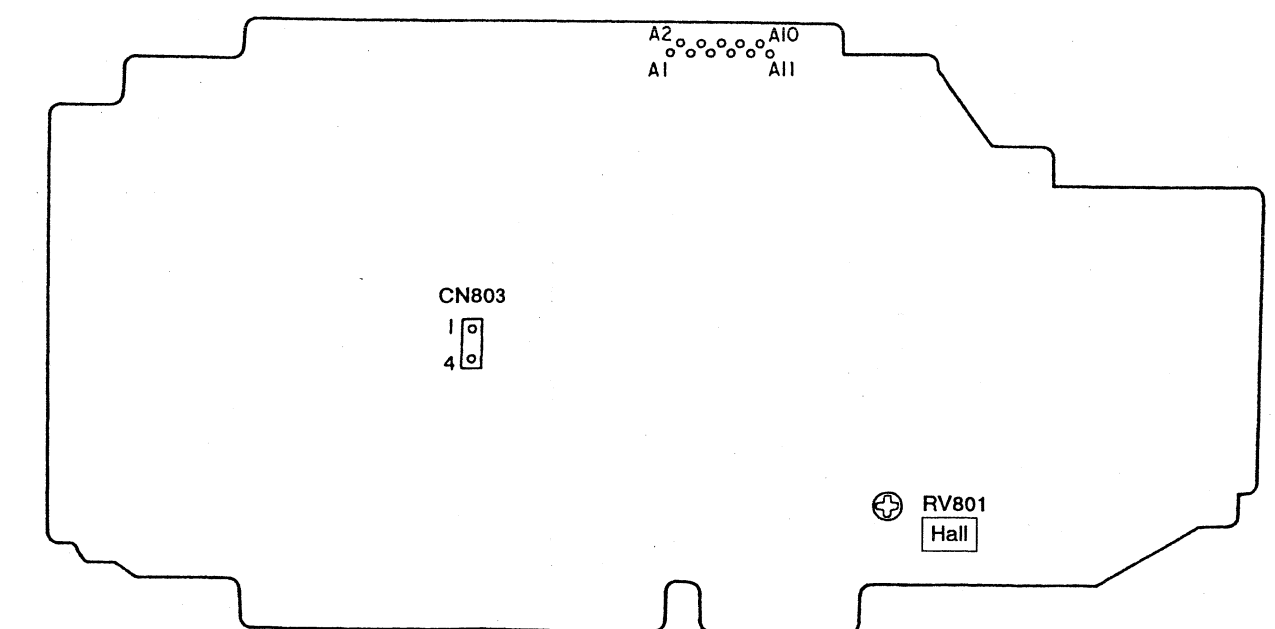
VF-14 BOARD (COMPONENT SIDE)



VF-14 BOARD (CONDUCTOR SIDE)



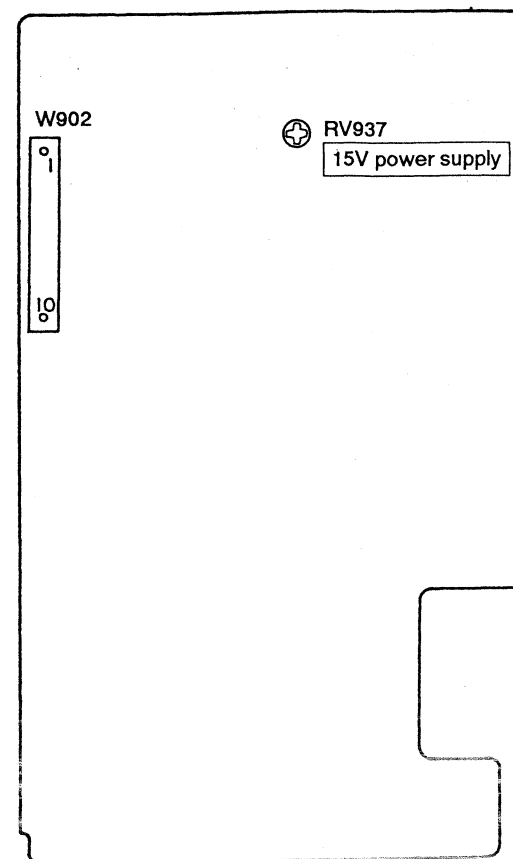
CV-8 BOARD (COMPONENT SIDE)



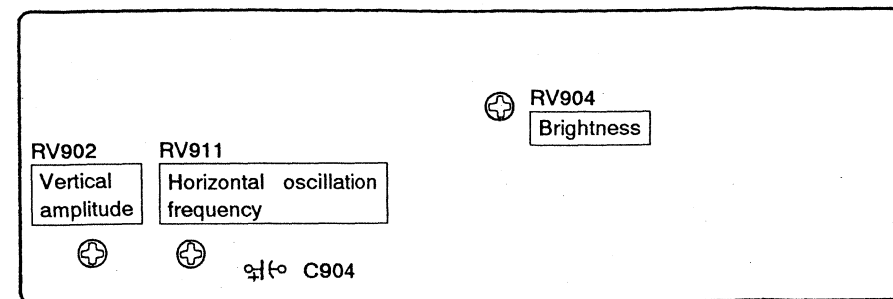
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-48.)

7-5. ADJUSTMENT ELEMENTS LOCATION

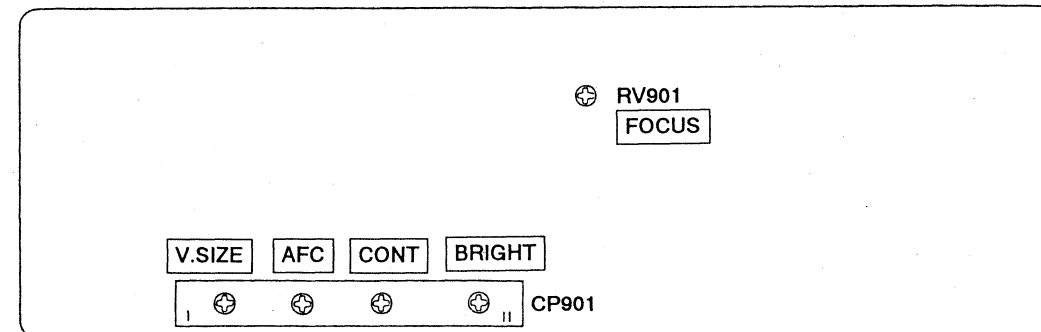
PS-225 BOARD (COMPONENT SIDE)



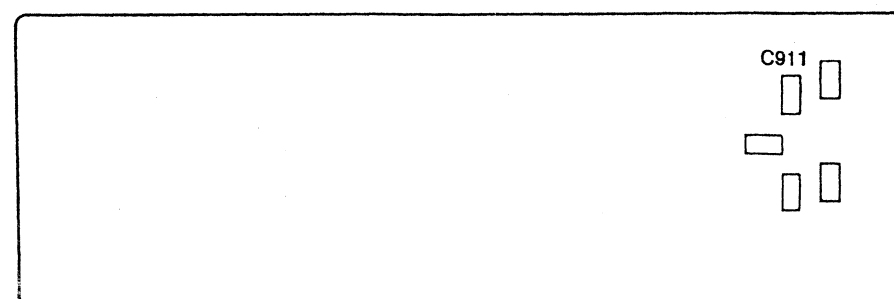
VF-14 BOARD (COMPONENT SIDE)



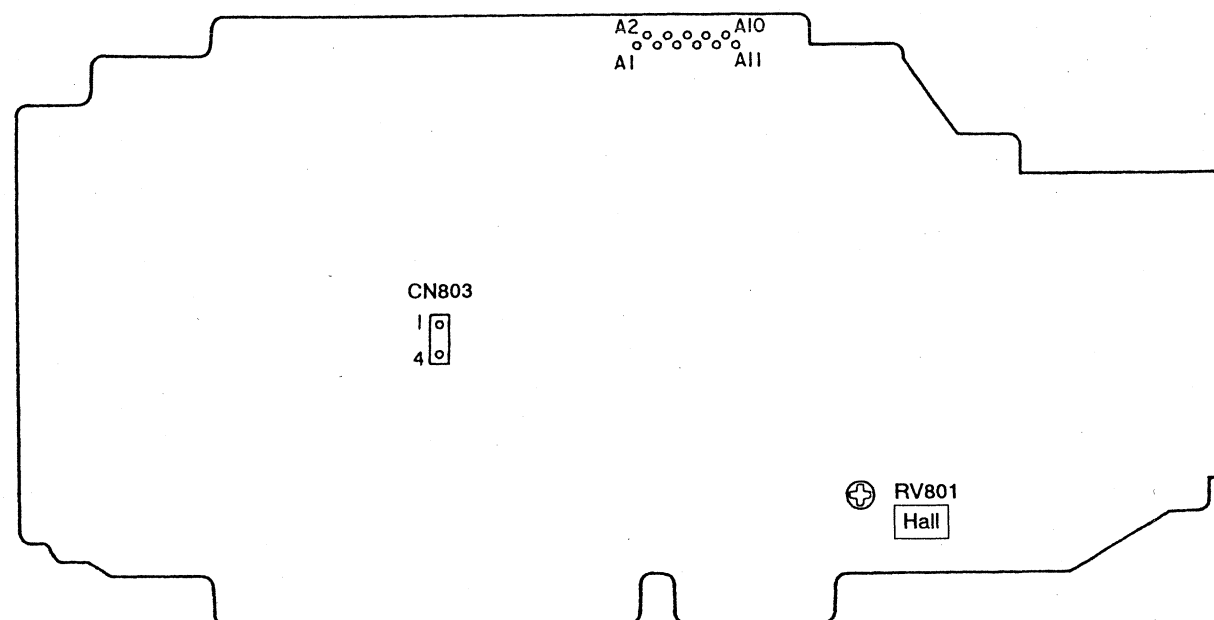
VF-22 BOARD (COMPONENT SIDE)



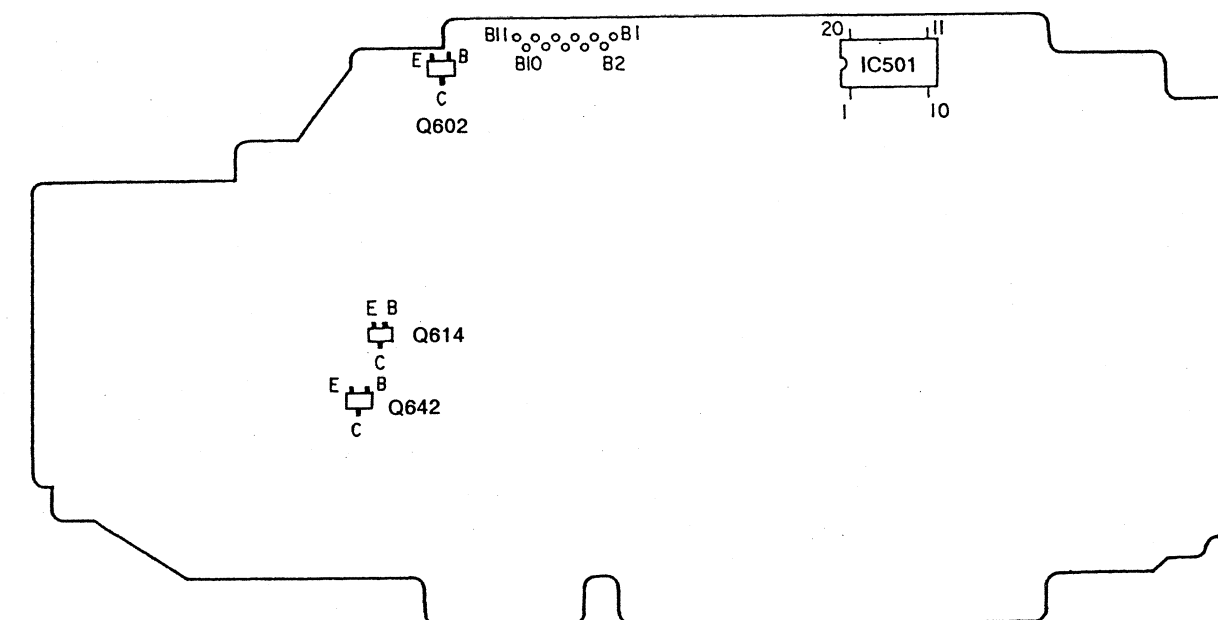
VF-14 BOARD (CONDUCTOR SIDE)



CV-8 BOARD (COMPONENT SIDE)



CV-8 BOARD (CONDUCTOR SIDE)



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SECTION 8

MECHANISM BLOCK ADJUSTMENTS

Mechanism Block Adjustments

Refer to the separate "8mm Video Mechanical Adjustment Manual III U Mechanism" for adjustment and checking of the mechanism block and for replacement of mechanical parts.
Refer to the following for setting of track shift mode.

8-1. TRACK SHIFT MODE SETTING

[Setting method]

- Connect the TEST A terminal and TEST B terminal to the COM terminal. Connect Pin ① and Pin ③ of CN508 on the VK-3 board to Pin ②. (See Fig. 8-1.)

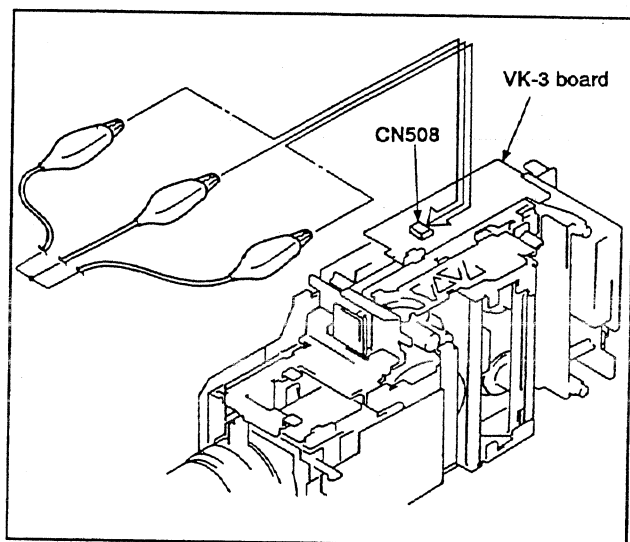


Fig. 8-1.

8-2. PREPARATION FOR ADJUSTMENT

- 1) Perform cleaning of the tape running surface (tape guides, drums, capstan shafts, and pinch rollers).
- 2) Connection of oscilloscope
CH 1: RF signal output (V RF OUT) of drum head
Pin ③ (V RF OUT) of CN102 on the CO-2 board
External trigger: External trigger output (RF SW.P)
Pin ④ of CN102 on the CO-2 board.
- 3) Play back the alignment tape (WR5-1N, Ref No. J-5) for tracking.
- 4) Confirm that the RF waveform on oscilloscope at both entrance and exit sides is flat. (See Fig. 8-3.)
Perform the adjustment described below if not flat.

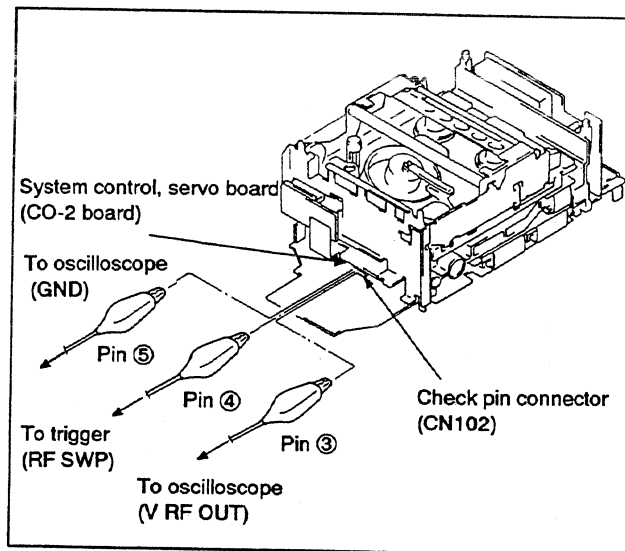


Fig. 8-2.

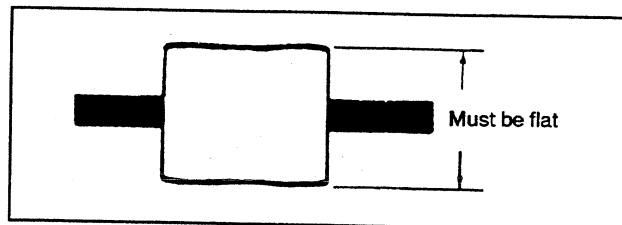


Fig. 8-3.

SECTION 9

VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the adjustment element location to the adjustment from page 254.

Use the following measuring instruments for adjustment of the VTR block.

[Equipment to be used]

- 1) Monitor TV
- 2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
- 3) Frequency counter
- 4) Pattern generator with video output terminal
- 5) Digital voltmeter
- 6) Audio generator
- 7) Audio level meter
- 8) Audio distortion meter
- 9) Audio attenuator
- 10) Regulated power supply
- 11) Alignment tapes

Tracking adjustment (WR5-1NP) *1

Parts Code: 8-967-995-02

Video frequency characteristics adjustment (WR5-6N) *2

Parts Code: 8-967-995-12

Operation check (WR5-4NL) *3

Parts Code: 8-967-995-51

(WR5-5NSP) *4

Parts Code: 8-967-995-42

Note:

- *1 WR5-1N (8-967-995-01) is also available.
- *2 WR5-2N (8-967-995-11) is also available.
- *3 WR5-3NL (8-967-995-31) is also available.
- *4 WR5-3NSP (8-967-995-22) and WR5-4NSP (8-967-995-41) are also available.

- 12) Adjustment remote controller (J-6082-053-A)

[Connection of equipment]

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the diagram below.

- Camera/video power switch.....Video position

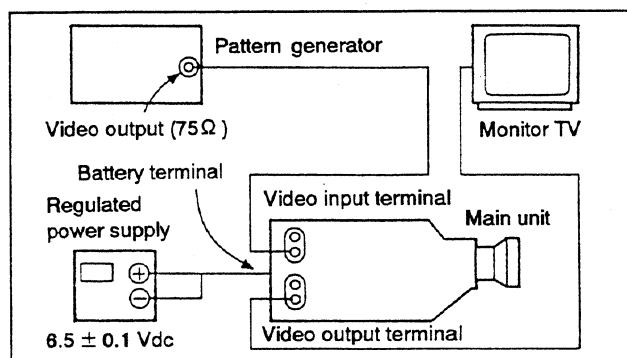


Fig. 9-1.

[Set-up during adjustment]

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VTR block, it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to J202 (video input terminal) on the CV-8 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Red" signal is 0.30 : 0.66. The video signal (color bars) used for VTR block electrical adjustment are shown in Fig. 9-2.

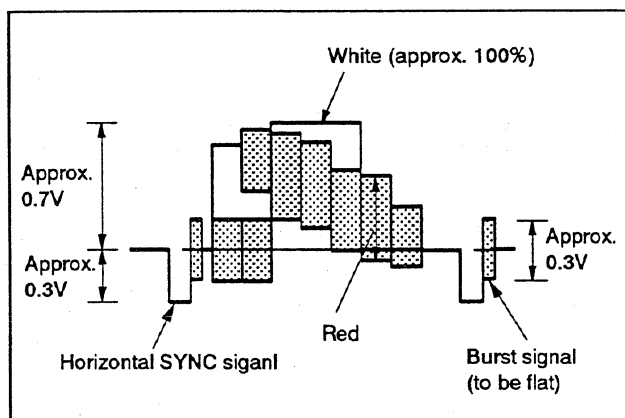


Fig. 9-2. Color bar signal of pattern generator

[Alignment tapes]

Tape	Content	Use
Tracking (WR5-1NP)	1. Recording area: PCM – video 2. Recording content: CH2: 1 MHz linearity adjustment signal (CH1: 9 MHz)	Drum linearity adjustment
Video Frequency Response (WR5-6N)	1. Recording area: Video 2. Recording content: RF sweep 0 to 10 MHz 3. Maker: 1, 3.58, 5.5 and 7 MHz	Frequency response adjustment
Operation Check SP mode (WR5-5NSP) LP mode (WR5-4NL) Note: PCM area is not included in WR5-4NL	1. Recording area: Video 2. Recording content: ■ Video area • Video signals Color bars 4 minutes Monoscope 4 minutes (Color bars) • Audio signals (AFM) 400 Hz 60% modulation ■ PCM area • Audio signals (PCM) 1 kHz 4 minutes Color bar 20 Hz 2 sec } Iterative 400 Hz 4 sec } Monoscope 14 kHz 2 sec }	Operation check

[I/O level and Impedance]

Video input	Pin jack Input signal: 1 Vp-p, 75Ω unbalanced, negative sync
Video output	Pin jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio input	Pin jack Input level: -7.5 dBs (0 dBs=0.775 Vrms) Input impedance: More than 47 kΩ
Audio output	Pin jack Specified output: -7.5 dBs Output impedance: More than 2.2 kΩ

[Service modes]

This unit is equipped with service modes for adjustment and operation checking.

There are the following two service modes and switching between them is by connection between GND and Pin (B6) of the check point array on the CV-8 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array (CV-8 board)
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to Camera Block Adjustment for details on the EVR adjustment mode.

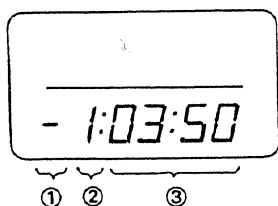
1. Invoking service mode

- 1) Connect the adjustment remote controller to the remote terminal (J951 on RC-29 board) of the main unit.
- 2) Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connection between Pin (B6) of the check point array and GND is required.)

2. Indication on adjustment remote controller LCD in status indication mode

Note: In categories 1 through 4, the same information is displayed in the EVF screen and on the monitor screen (when the data screen is ON).



- ① Minus segment flashes to indicate that the service mode has been invoked.
- ② Indicates service mode category.
- ③ Indicates battery voltage, LAST EMG, PRESET EMG, or MODE SW CODE according to current category.

3. Category selection and indication in each category

Select the desired category with the [FF] or [REW] button of the adjustment remote controller. There are four categories (1 through 4) and the indications are different for each. (Note that category 0 is the EVR adjustment mode.)

Category	Indication on LCD																
1	A/D conversion value for battery voltage (decimal indication) ¹⁾ 00 : 00 – 02 : 55																
2	LAST EMG (last emergency) ²⁾ Refer to Service Mode Error Indications.																
3	PRESENT EMG (current emergency) ³⁾ Refer to Service Mode Error Indications.																
4	MODE SW CODE (mechanism status) <table border="1"> <tr> <td>00 : 00</td><td>EJECT</td></tr> <tr> <td>00 : 01</td><td>I.A</td></tr> <tr> <td>00 : 02</td><td>UNLOAD</td></tr> <tr> <td>00 : 03</td><td>I.B</td></tr> <tr> <td>00 : 04</td><td>STOP (threading completed)</td></tr> <tr> <td>00 : 05</td><td>I.C</td></tr> <tr> <td>00 : 06</td><td>RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)</td></tr> <tr> <td>00 : AA</td><td>Mode switch error</td></tr> </table>	00 : 00	EJECT	00 : 01	I.A	00 : 02	UNLOAD	00 : 03	I.B	00 : 04	STOP (threading completed)	00 : 05	I.C	00 : 06	RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)	00 : AA	Mode switch error
00 : 00	EJECT																
00 : 01	I.A																
00 : 02	UNLOAD																
00 : 03	I.B																
00 : 04	STOP (threading completed)																
00 : 05	I.C																
00 : 06	RP(REC, PB, FF, REW, CUE, REVIEW, PAUSE)																
00 : AA	Mode switch error																

- Notes:**
- 1) Indicates a value proportional to the battery voltage.
 - 2) LAST EMG indicates the error occurring last before entering service mode. Even if an error occurs in the service mode, it is not indicated.
 - 3) PRESENT EMG indicates the status when the [FF] or [REW] button of the adjustment remote controller was pressed. So, the indication does not change even if the error is eliminated.

• Service mode error indication

Error Status	PRESENT EMG Indication LAST EMG	Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM PG error (0) when starting drum	00 : 05	00 : 05
DRUM PG error (1) when starting drum	01 : 05	00 : 14 or 00 : 0E
DRUM PG error (2) when starting drum	02 : 05	00 : 15 or 00 : 0F
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14 or 00 : 0E
No DRUM PG (2) when starting drum	02 : 06	00 : 15 or 00 : 0F
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14 or 00 : 0E
DRUM FG error (2) when drum stationary	02 : 07	00 : 15 or 00 : 0F
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14 or 00 : 0E
No DRUM PG (2) when drum stationary	02 : 08	00 : 15 or 00 : 0F
Phase error (0) when drum stationary	00 : 09	00 : 09

- (1) During tape threading
(2) During tape unthreading
(0) Other

4. Releasing service mode

The service mode is released by returning the HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

[Test modes]

This unit has three test modes which are invoked by connecting the terminals of CN508 on the VK-3 board.

Test Mode	Connection of CN508 on VK-3 Board	Function
1	Pin ③ (TEST A) and Pin ② (GND) short-circuited	1. Switching position adjustment possible. 2. Error detection disabled.
2	Pin ① (TEST B) and Pin ② (GND) short-circuited	1. For battery end detection adjustment BATTERY SENSE voltage (input voltage to Pin ④ of IC501) is displayed in EVF and monitor screen (only when data screen is ON). - 1 : 03 : 05 ↑ ↑ Mode BATTERY indication SENSE voltage
3	Pin ③ (TEST A) and Pin ② (GND)/Pin ① (TEST B) and Pin ② short-circuited.	1. For tape path adjustment (Tracking shifted by 1/4 track) Refer to MECHANISM ADJUSTMENTS.

9-1. POWER SUPPLY ADJUSTMENTS AND CHECKS

9-1-1. Oscillation Frequency Adjustment (PS-225 Board)

Mode	Stop (POWER ON)
Measurement Point	Collector of Q941
Measuring Instrument	Frequency counter
Adjustment Element	RV938
Specified Value	475 ± 5 kHz

Adjustment method:

- 1) Adjust the oscillation frequency to 475 ± 5 kHz with RV938.

9-1-2. Video 5V Adjustment (PS-225 Board)

Mode	Stop (POWER ON)
Measurement Point	Pin ① of W901
Measuring Instrument	Digital voltmeter
Adjustment Element	RV936
Specified Value	5.00 ± 0.05 Vdc

Adjustment method:

- 1) Adjust with RV936 so that it becomes 5.00 ± 0.05 Vdc.

9-2. SYSTEM CONTROL ADJUSTMENTS

9-2-1. Battery Down Adjustment (CO-2 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Confirmation on monitor screen
Measuring Instrument	
Adjustment Element	RV551
Specified Value	Battery indication (🔋) flashes at 0.8s cycle and counter value is approximately "–1 : 02 : 85".

Connections:

- 1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-3.
- 2) Connect Pin ① (TEST B) and Pin ② (GND) of CN508 on the VK-3 board with a jumper wire. (Test 2 mode)

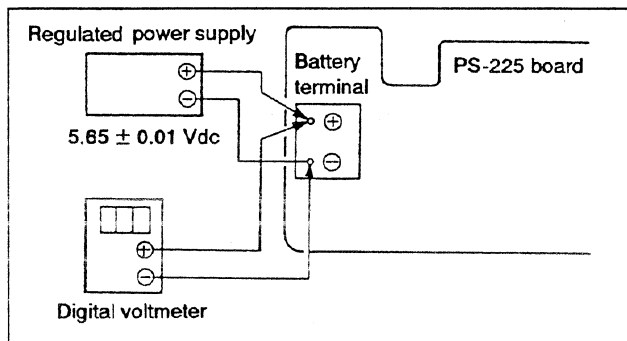


Fig. 9-3.

Adjustment method:

- 1) Press the data screen button (S509) on the VK-3 board to display the counter on the monitor screen. (See Fig. 9-4.)
- 2) Confirm that the indication on the digital voltmeter is 5.65 ± 0.01 Vdc.
- 3) Slowly rotate RV551 and set to the closest point at which the battery indication (🔋) on the monitor screen flashes at a rate of 3.2 times per seconds (3.2 Hz) and the counter value is "–1 : 02 : 85".

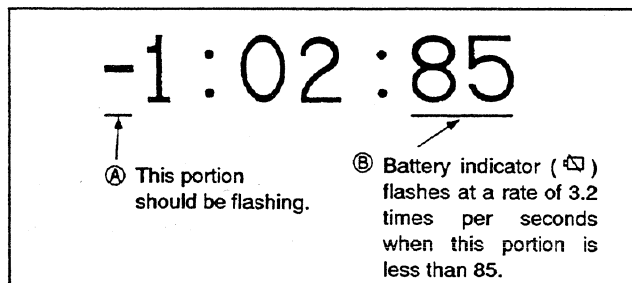


Fig. 9-4.

Checking method:

Perform the following checks and repeat the adjustments again if the required conditions are not satisfied.

- 1) Adjust the output voltage of the regulated power supply so that the indication of the digital voltmeter becomes 5.6 ± 0.01 Vdc.
- 2) Set the unit to the camera REC mode after turning the power off and then on.
- 3) Press the data screen button on the VK-3 board so that there is data indication on the monitor screen.
- 4) Confirm that the battery indicator (🔋) is not lit up on the monitor screen (or flashing at a rate of 0.8 times per seconds).
- 5) Slowly lower the output voltage of the regulated power supply until the indication on the digital voltmeter becomes 5.45 ± 0.01 Vdc.
- 6) Confirm that the battery indicator (🔋) is flashing on the monitor screen at a rate of 3.2 times per seconds (3.2 Hz).

9-2-2. System Clock Adjustment (CK-19 Board)

Mode	Power ON
Measurement Point	Pin ⑩ of IC651
Measuring Instrument	Frequency counter
Adjustment Element	RV651
Specified Value	330 ± 5 kHz

Adjustment method:

- 1) Adjust with RV651 so that it becomes 330 ± 5 kHz.

9-2-3. Clock Precision Adjustment (CK-19 Board)

Mode	Power OFF
Measurement Point	Pin ④ of IC651
Measuring Instrument	Frequency Counter
Adjustment Element	CV651
Specified Value	8192.00 ± 0.04 Hz

Adjustment method:

- 1) Disconnect the main power supply and lithium battery.
- 2) Connect Pin ④ (TEST) of IC651 to ground using a jumper wire (TEST mode).
- 3) Supply 3V (3.0 ± 0.05 Vdc) of power to the lithium battery terminals from a regulated power supply.
- 4) Adjust to 8192.00 ± 0.04 Hz using CV651.
- 5) Disconnect the regulated power supply and the jumper wire.

9-3. SERVO SYSTEM ADJUSTMENTS

9-3-1. Oscillation Frequency Adjustment (CO-2 Board)

Mode	Playback
Signal	Arbitrary tape
Measurement Point	Pin ⑩ of IC621
Measuring Instrument	Frequency counter
Adjustment Element	RV621
Specified Value	480 ± 5 kHz

Adjustment method:

- 1) Set the oscillation frequency to 480 ± 5 kHz using RV621.

9-3-2. REC ATF Level Checking (CO-2 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q530
Measuring Instrument	Oscilloscope
Specified Value	Approx. 900 mVp-p

Checking method:

- 1) Confirm that the REC ATF signal level is approximately 900 mVp-p.

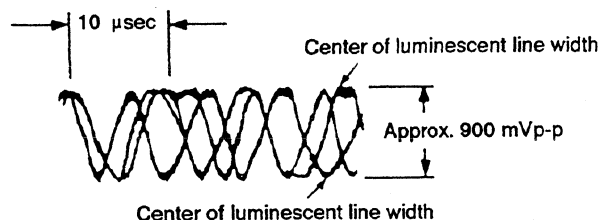


Fig. 9-5. REC ATF level checking

9-3-3. Switching Position Adjustment (CO-2 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5NSP)
Measurement Point	CH-1: J201 (video output) on CV-8 board CH-2: Pin ④ (RF SWP) of CN102
Measuring Instrument	Oscilloscope
Adjustment Element	RV501
Specified Value	$6.5 \pm 0.3H$ ($410 \pm 20 \mu s$)

Connections:

- 1) Connect Pin ③ (TEST A) and Pin ② (GND) of CN508 on the VK-3 board using a jumper wire. (Test 1 mode)

Adjustment method:

- 1) Adjust with RV501 so that it becomes $6.5 \pm 0.3H$ ($410 \pm 20 \mu s$).

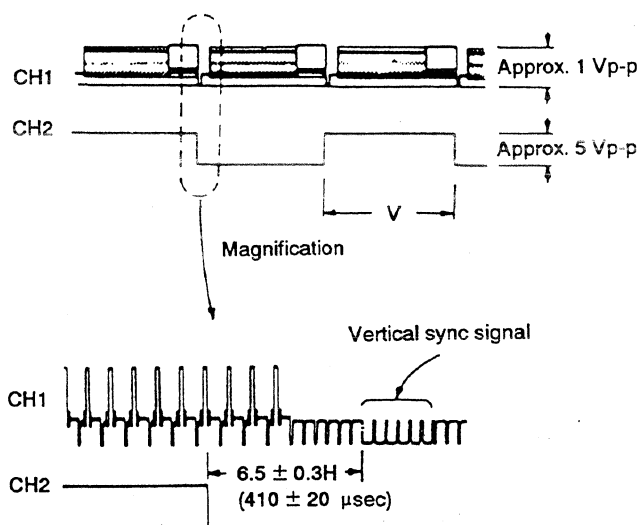


Fig. 9-6. Switching position adjustment

9-3-4. Capstan FG Adjustment (CO-2 Board)

Mode	Playback (LP)
Signal	Alignment tape: For operation checking (WR5-4NL)
Measurement Point	Pin ① of IC510
Measuring Instrument	Oscilloscope
Adjustment Element	RV502
Specified Value	Minimum amplitude

Adjustment method:

- 1) Adjust RV502 so there is minimum amplitude of the output waveform (capstan error) from Pin ① of IC510.

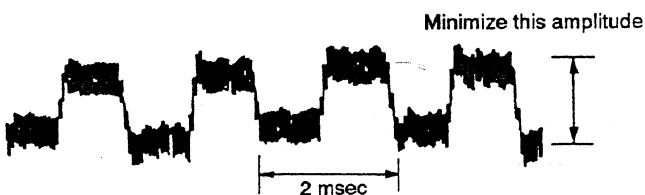


Fig. 9-7. Capstan FG adjustment

9-3-5. Still Adjustment (CV-8 Board)

Mode	Playback pause
Signal	Self-recorded tape of color bars signal
Measurement Point	Monitor TV screen
Measuring Instrument	
Adjustment Element	RV552
Specified Value	No noise on monitor TV screen except for upper and lower 1/3 sections.

Adjustment method:

- 1) Play back the self-recorded tape and press the PAUSE button to set the playback pause mode after the image has stabilized.
- 2) Confirm that the noise on the monitor screen is confined to the upper and lower 1/3 sections.
- 3) If the specified condition is not satisfied, adjust RV552 and repeat 1) and 2).

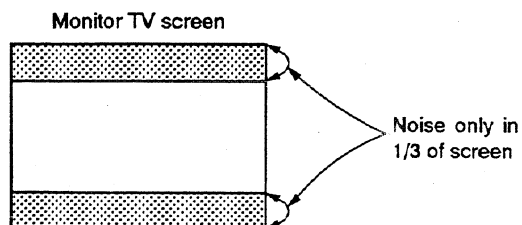


Fig. 9-8. Still adjustment

9-4. VIDEO BLOCK ADJUSTMENT

The adjustment of the video system should in principle follow the adjustment procedure outlined below.

The color video signal supplied from the pattern generator is utilized as the video input signal for video system adjustment in the recording mode. Make sure that the sync signal and color burst signal match the specifications given in set-up for adjustment, as shown in Fig. 9-2.

[Adjustment procedure]

- 1) Playback frequency characteristics adjustment
- 2) Flying erase check
- 3) Crystal oscillator fo adjustment
- 4) Y/C separation adjustment
- 5) IR2 adjustment
- 6) SYNC AGC adjustment
- 7) Emphasis input level adjustment
- 8) PB Y level adjustment
- 9) Y FM carrier frequency adjustment
- 10) Y FM deviation adjustment
- 11) Chroma emphasis fo adjustment
- 12) REC Y level adjustment
- 13) REC C level adjustment
- 14) DDS character position adjustment
- 15) Character generator fo adjustment

9-4-1. Playback Frequency Characteristics Adjustment (CO-2 Board)

1. CH1, CH2 adjustment

The adjusting element for CH2 is shown in parentheses [].

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6N)
Measurement Point	Pin ③ of CN102 External trigger: Pin ④ of CN102 Trigger slope: +, [-]
Measuring Instrument	Oscilloscope
Adjustment Element	RV101 [RV102]
Specified Value	3.58 MHz level : 5.5 MHz level=4 : 3

Adjustment method:

- 1) Adjust RV101 [RV102] so that the ratio of the 3.58 MHz level to the 5.5 MHz level is 4 : 3 [4 : 3].

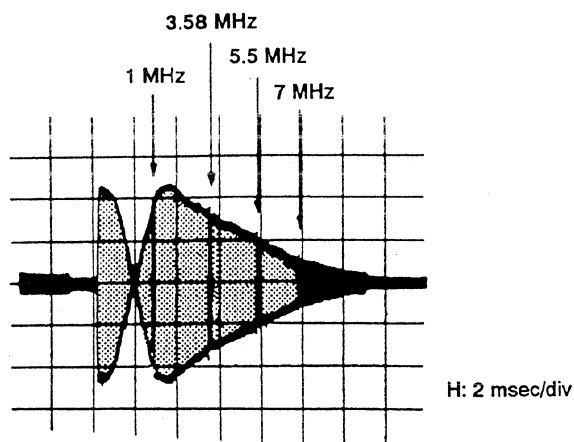


Fig. 9-9. Playback frequency characteristics adjustment

9-4-2. Flying Erase Check (CO-2 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑫ of CN101 (TP103: FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Over 7.5 MHz Voltage: Over 7.0 Vp-p

Note: Be sure to use MP type tape. (Pin ⑪ of CN501 should be "L".)

Checking method:

- 1) Confirm that the oscillation frequency is over 7.5 MHz and the oscillation voltage is over 7.0 Vp-p.

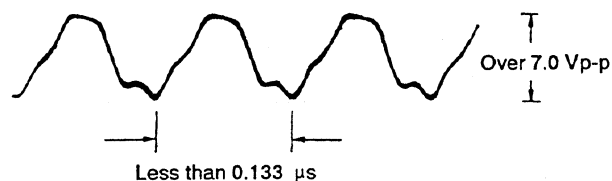


Fig. 9-10.

9-4-3. Crystal Oscillator fo Checking (CV-8 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5NSP)
Measurement Point	Pin ⑤ of IC202
Measuring Instrument	Frequency counter
Specified Value	3579545 $\pm$ 70 Hz

Note: Connect the frequency counter through a buffer having high impedance (approx. 10 M Ω) and low capacitance (less than 10 pF).

Checking method:

- 1) Confirm that the oscillation frequency at Pin ⑤ of IC202 is 3579545 $\pm$ 70 Hz.

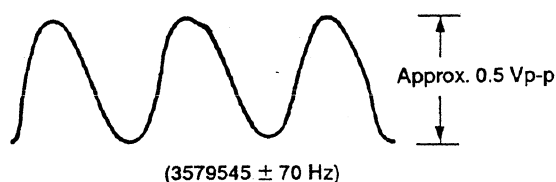


Fig. 9-11. Crystal oscillator fo adjustment

9-4-4. Y/C Separation Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV204 (DEV) (Pin ②⑤ of IC203)
Measuring Instrument	Oscilloscope
Adjustment Element	RV202
Specified Value	Minimum residual chroma component

Connections:

- 1) Connect Pin ②⑤ of IC203 (Pin ①⑤ of IC202) to GND with a 10 μ F/16V electrolytic capacitor. (Capacitor negative side to GND)

Adjustment method:

- 1) Set the residual chroma component to minimum with RV202.

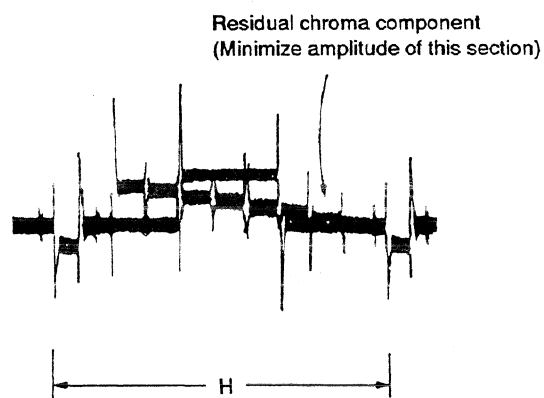


Fig. 9-12. Y/C separation adjustment

9-4-5. IR2 Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bars
Measurement Point	CH1: Pin ⑤ of IC203 (REC C RF OUT) CH2: Pin ⑧ of IC203 or base of Q252 (BF OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV203
Specified Value	a=b (see Fig. 9-13)

Adjustment method:

- 1) Line up the falling edge (┘) of the CH2 burst pulse with the center of the CH1 burst signal using RV203. (See Fig. 9-13.)

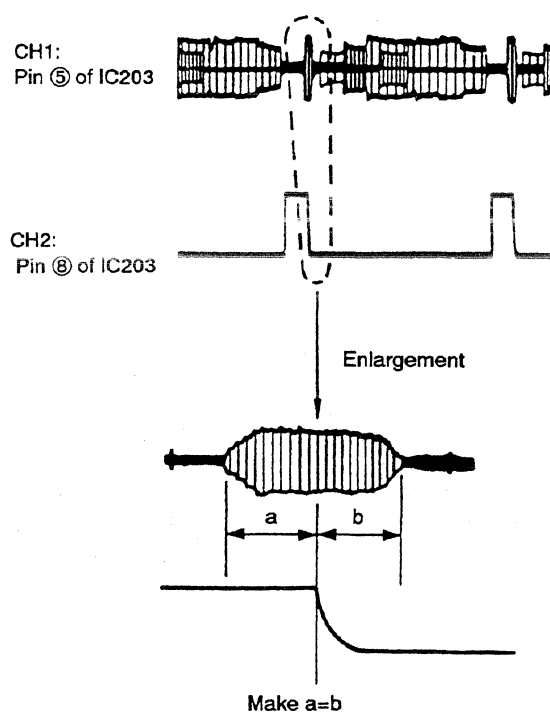


Fig. 9-13. IR2 adjustment

9-4-6. SYNC AGC Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ④ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV201
Specified Value	$0.50 \pm 0.025 \text{ Vp-p}$

Adjustment method:

- 1) Adjust with RV201 so that it becomes $0.50 \pm 0.025 \text{ Vp-p}$.

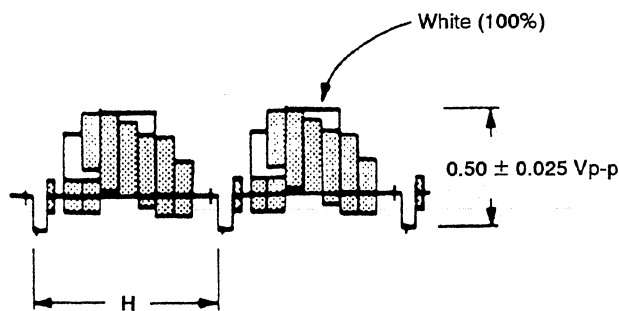


Fig. 9-14. SYNC AGC adjustment

9-4-7. Emphasis Input Level Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ⑤ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV209
Specified Value	$0.50 \pm 0.025 \text{ Vp-p}$

Adjustment method:

- 1) Adjust with RV209 so that it becomes $0.50 \pm 0.025 \text{ Vp-p}$.

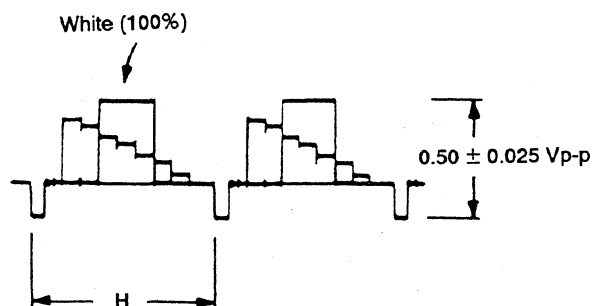


Fig. 9-15. Emphasis input level adjustment

9-4-8. PB Y Level Adjustment (CV-8 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5NSP) Color bar section.
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV206
Specified Value	$1.00 \pm 0.05 \text{ Vp-p}$

Note: Terminate VIDEO OUT (J201) at 75Ω .

Adjustment method:

- 1) Adjust with RV206 so that it becomes $1.00 \pm 0.05 \text{ Vp-p}$.

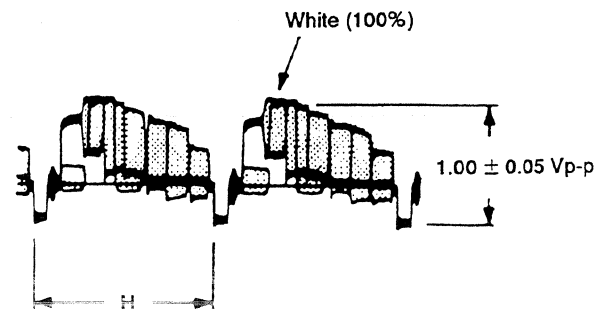


Fig. 9-16. PB Y level adjustment

9-4-9. Y FM Carrier Frequency Adjustment (CV-8 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q232 side terminal of RV207 (REC Y)
Measuring Instrument	Frequency counter
Adjustment Element	RV205
Specified Value	$4.38 \pm 0.04 \text{ MHz}$

Adjustment method:

- 1) Adjust to $4.38 \pm 0.04 \text{ MHz}$ with RV205.
- 2) Perform "Deviation Adjustment".

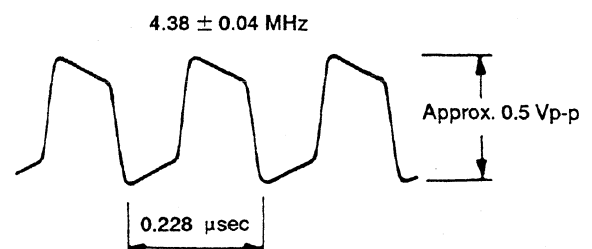


Fig. 9-17. Y FM carrier frequency adjustment

9-4-10. Y FM Deviation Adjustment (CV-8 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	J201 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV204
Specified Value	Playback level is 1.00 ± 0.05 Vp-p

Notes: 1) Confirm that "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

2) Terminate VIDEO OUT (J201) at 75Ω .

Adjustment method:

- 1) Record the color bar signal.
- 2) Playback the recorded signal.
- 3) Confirm the playback output.
Specified value: 1.00 ± 0.05 Vp-p
- 4) If the specified value is not satisfied, repeat 1) to 3) after turning RV204 in the following manner.

	Rotation direction of RV204
When larger than specified value	Clockwise (○)
When smaller than specified value	Counterclockwise (○)

Table 9-1.

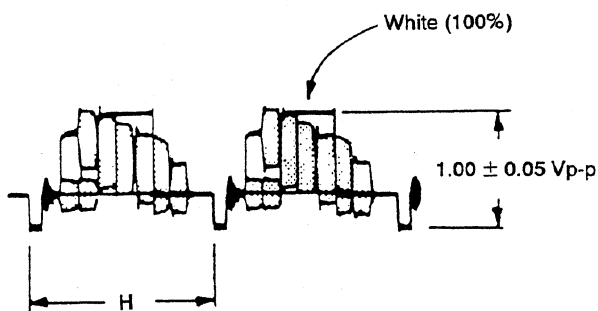


Fig. 9-18. Y FM deviation adjustment

9-4-11. Chroma Emphasis fo Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Center terminal of RV208 (REC C)
Measuring Instrument	Oscilloscope
Adjustment Element	FL202
Specified Value	Minimum fo component

Adjustment method:

- 1) Adjust with FL202 so that amplitude of the flat section of the chroma signal REC section becomes minimum.

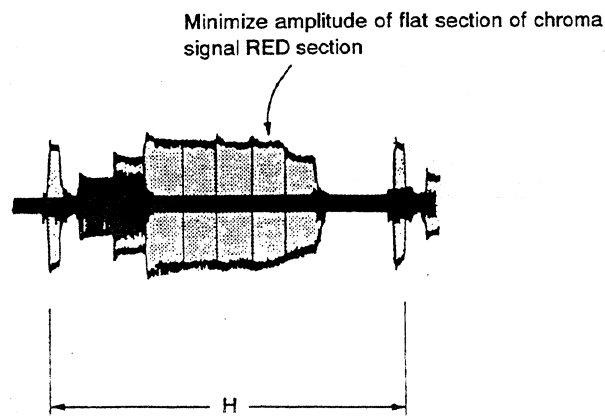


Fig. 9-19. Chroma emphasis fo adjustment

9-4-12. REC Y Level Adjustment (CV-8 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q230 (Pin ⑩ of CN502)
Measuring Instrument	Oscilloscope
Adjustment Element	RV207
Specified Value	265 ± 10 mVp-p

Adjustment method:

- 1) Adjust with RV207 so that it becomes 265 ± 10 mVp-p.

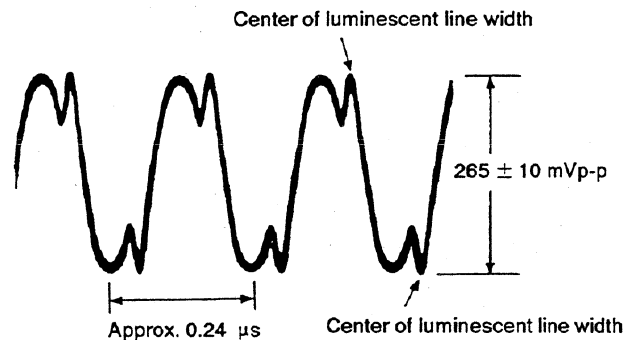


Fig. 9-20. REC Y Level Adjustment

9-4-13. REC C Level Adjustment (CV-8 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Emitter of Q233 (Pin ⑩ of CN502)
Measuring Instrument	Oscilloscope
Adjustment Element	RV208
Specified Value	$105 \pm 10 \text{ mVp-p}$

Adjustment method:

- 1) Adjust with RV208 so that it becomes $105 \pm 10 \text{ mVp-p}$.

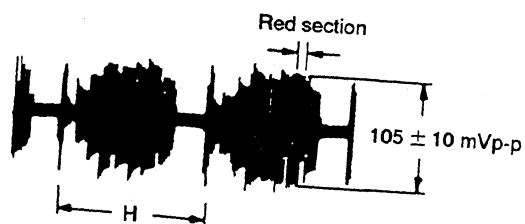


Fig. 9-21. REC C level adjustment

9-4-15. Character Generator fo Adjustment (CV-8 Board)

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ⑩ of IC501
Measuring Instrument	Frequency counter
Adjustment Element	CV502
Specified Value	$15734 \pm 100 \text{ Hz}$

Adjustment method:

- 1) Adjust CV502 so that it becomes $15734 \pm 100 \text{ Hz}$.

9-4-14. DDS Character Position Adjustment (CV-8 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5NSP) Color bar section
Measurement Point	Confirm on monitor TV screen
Measuring Instrument	
Adjustment Element	CV501
Specified Value	See Fig. 9-22.

Adjustment method:

- 1) Press the data screen button for indication of the counter on the monitor TV screen.
- 2) Adjust CV501 until the right inner contour of the number at the right side of the count indication is lined up with the border line between the red and blue color bars.

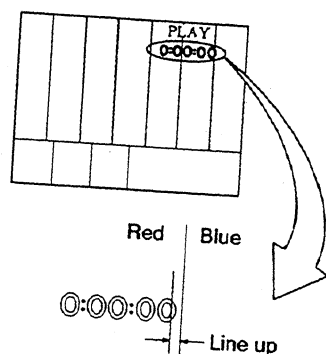


Fig. 9-22.

9-5. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]

In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to the video position for adjustment.

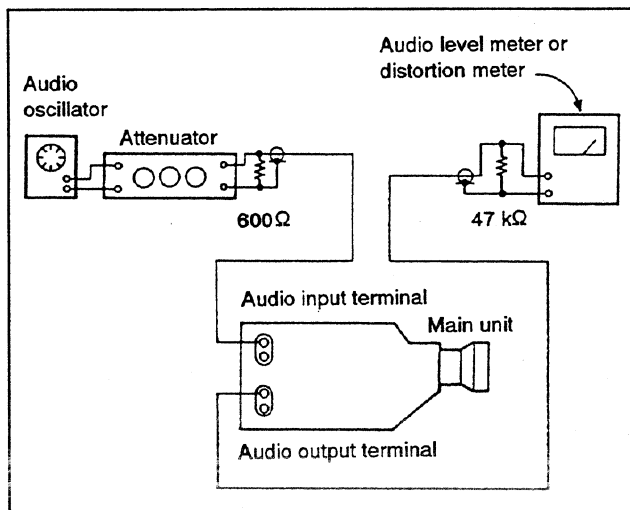


Fig. 9-23.

9-5-1. AFM Carrier Frequency Check (CO-2 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ② of IC401(REC AFM)
Measuring Instrument	Frequency counter
Specified Value	1.50 ± 0.01 MHz

Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) having high impedance and low capacitance.

Checking method:

- 1) Turn OFF the audio oscillator output.
- 2) Confirm that the AFM carrier frequency is 1.50 ± 0.01 MHz.

9-5-2. REC AFM Carrier Level Adjustment (CO-2 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ② of IC401 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	160 ± 5 mVp-p

Checking method:

- 1) Confirm that the level is 160 ± 5 mVp-p.

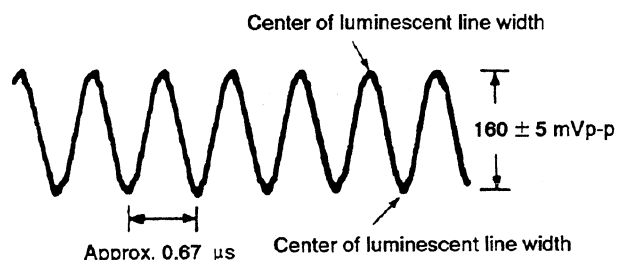


Fig. 9-24. REC AFM recording current adjustment

9-5-3. Playback Level Check

Mode	Playback
Signal	Alignment tape: Operation checking (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	-7.5 ± 2 dBs

Checking method:

- 1) Confirm that the audio output level is -7.5 ± 2 dBs.

9-5-4. E-E Output Level Check

Mode	E-E
Signal	400 Hz, -7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	-7.5 ± 2 dBs

Checking method:

- 1) Make sure that the audio output level is -7.5 ± 2 dBs.

9-5-5. Overall Level Characteristics Check

Mode	Self-recording and playback
Signal	400 Hz, -7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	-7.5 ± 3 dBs

Checking method:

- 1) Record the signal.
- 2) Playback the recorded section.
- 3) Make sure that the audio output level is -7.5 ± 3 dBs.

9-5-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback
Signal	Ⓐ 400 Hz, -17.5 dBs Ⓑ 30 Hz, -17.5 dBs Ⓒ 10 Hz, -17.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter
Specified Value	With the 400 Hz playback output level as 0 dB, the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB

Checking method:

- 1) Record signal Ⓐ through Ⓒ in order.
- 2) Playback the recorded sections.
- 3) With the 400 Hz playback output level as 0 dB, confirm that the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB.

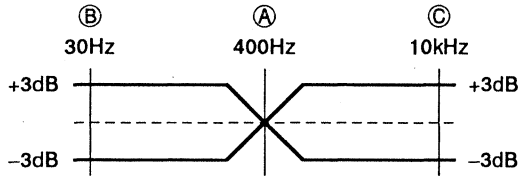


Fig. 9-25. AFM overall frequency characteristics

9-5-7. Overall Distortion Check

Mode	Self recording and playback
Signal	400 Hz, -7.5 dBs
Measurement Point	Audio output terminal
Measuring Instrument	Distortion meter
Specified Value	Less than 0.5% *1

Checking method:

- 1) Record the signal.
 - 2) Playback the recorded section.
 - 3) Confirm that the distortion is less than 0.5%. *1
- *1 Value when 200 Hz - 6 kHz BPF is used

9-5-8. Overall Noise Level Check

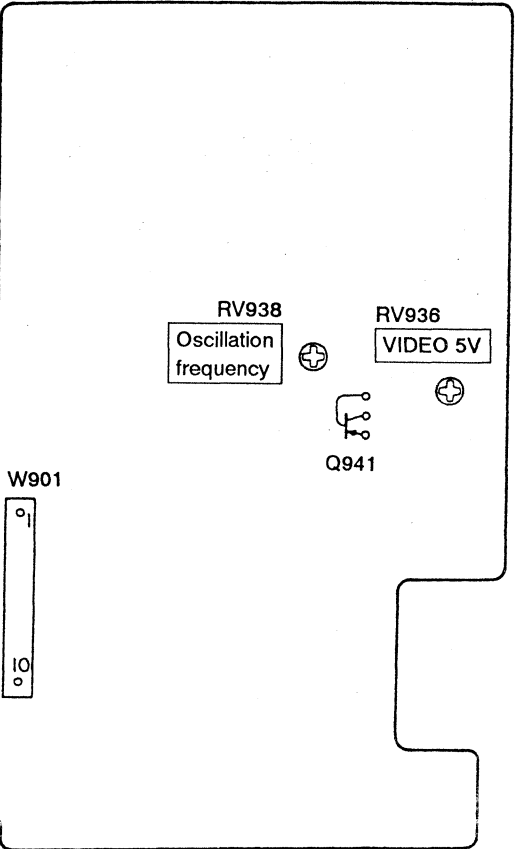
Mode	Self-recording and playback
Signal	No signal (shorting plug is inserted into audio input jack)
Measurement Point	Audio input terminal
Measuring Instrument	Audio level meter
Specified Value	Less than -67 dBs *2

Checking method:

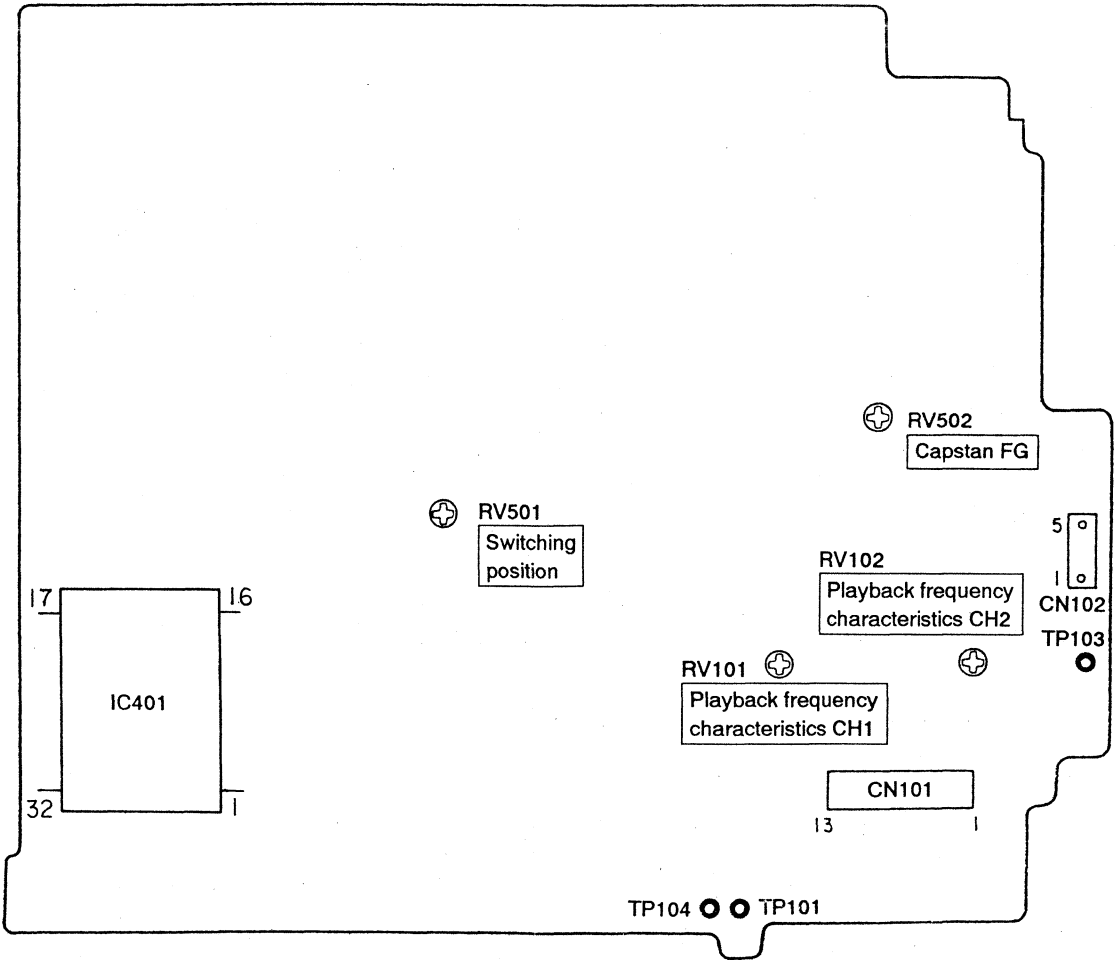
- 1) Record the signal.
 - 2) Playback the recorded section.
 - 3) Make sure that the noise level is less than -67 dBs. *2
- *2 Value when IHF-A hearing correction filter is used.

9-6. ADJUSTMENT ELEMENTS LOCATION

PS-225 BOARD (COMPONENT SIDE)

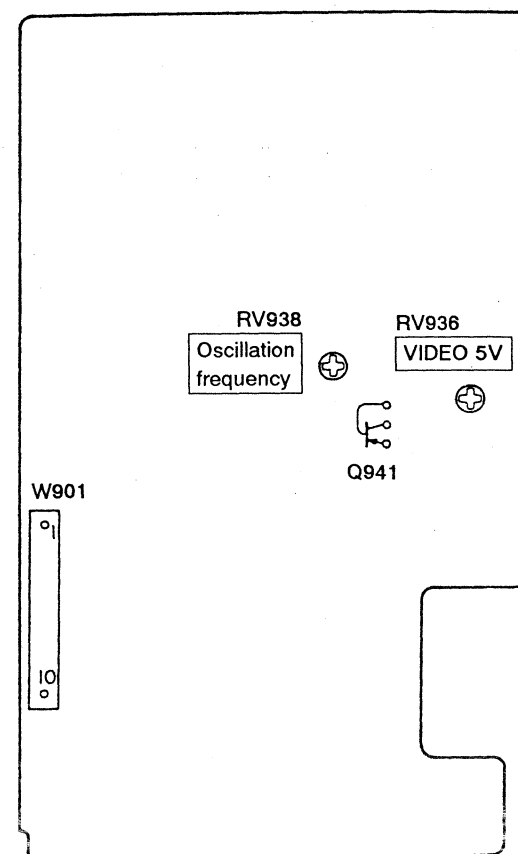


CO-2 BOARD (CONDUCTOR SIDE)

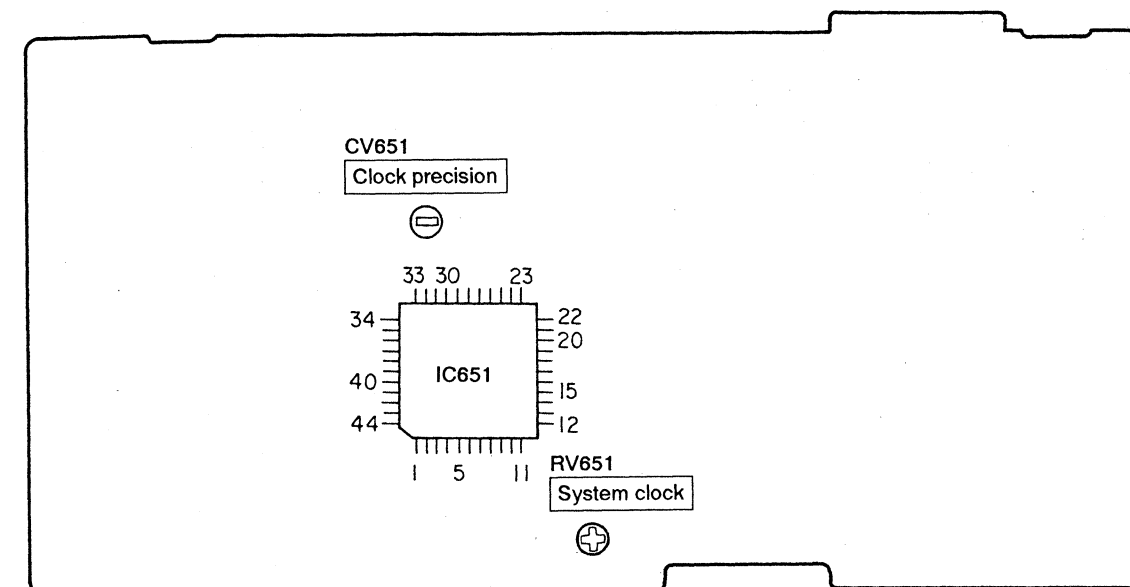


9-6. ADJUSTMENT ELEMENTS LOCATION

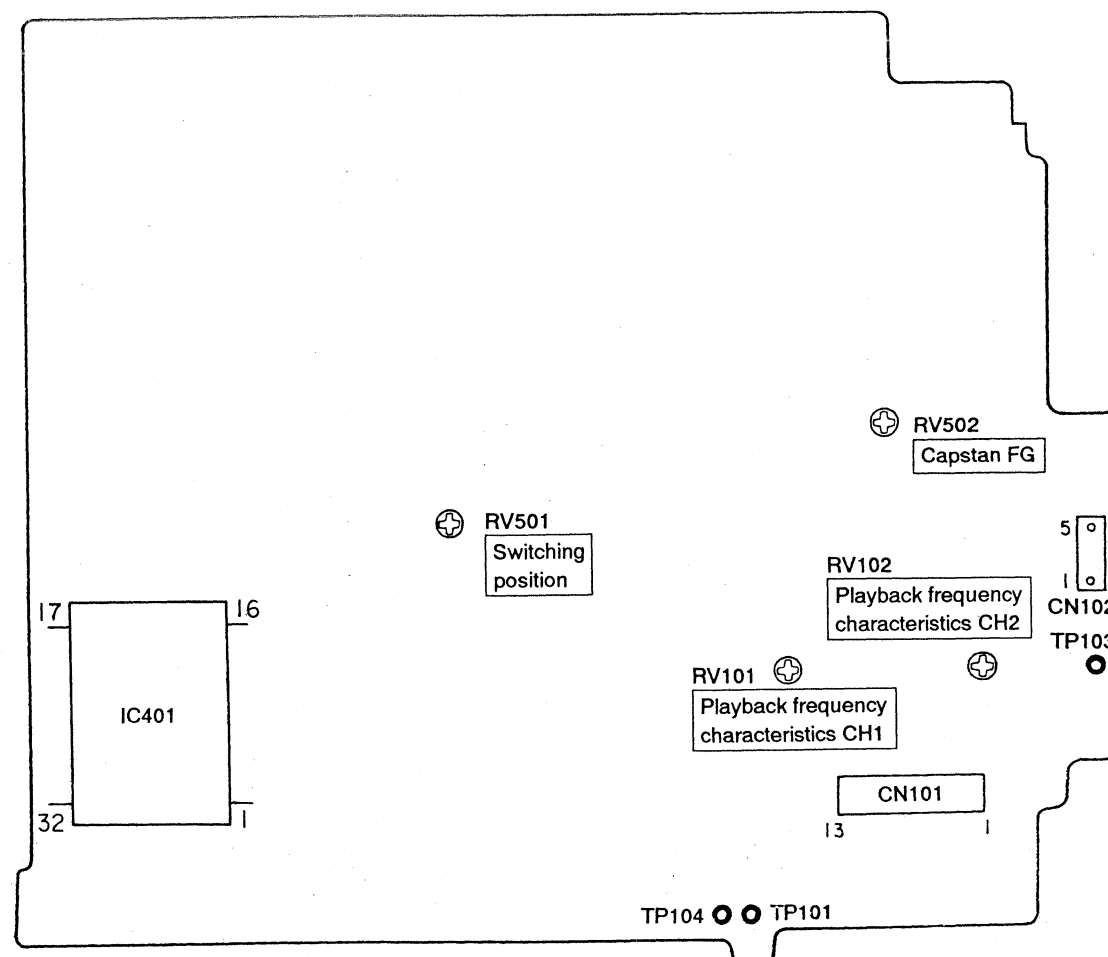
PS-225 BOARD (COMPONENT SIDE)



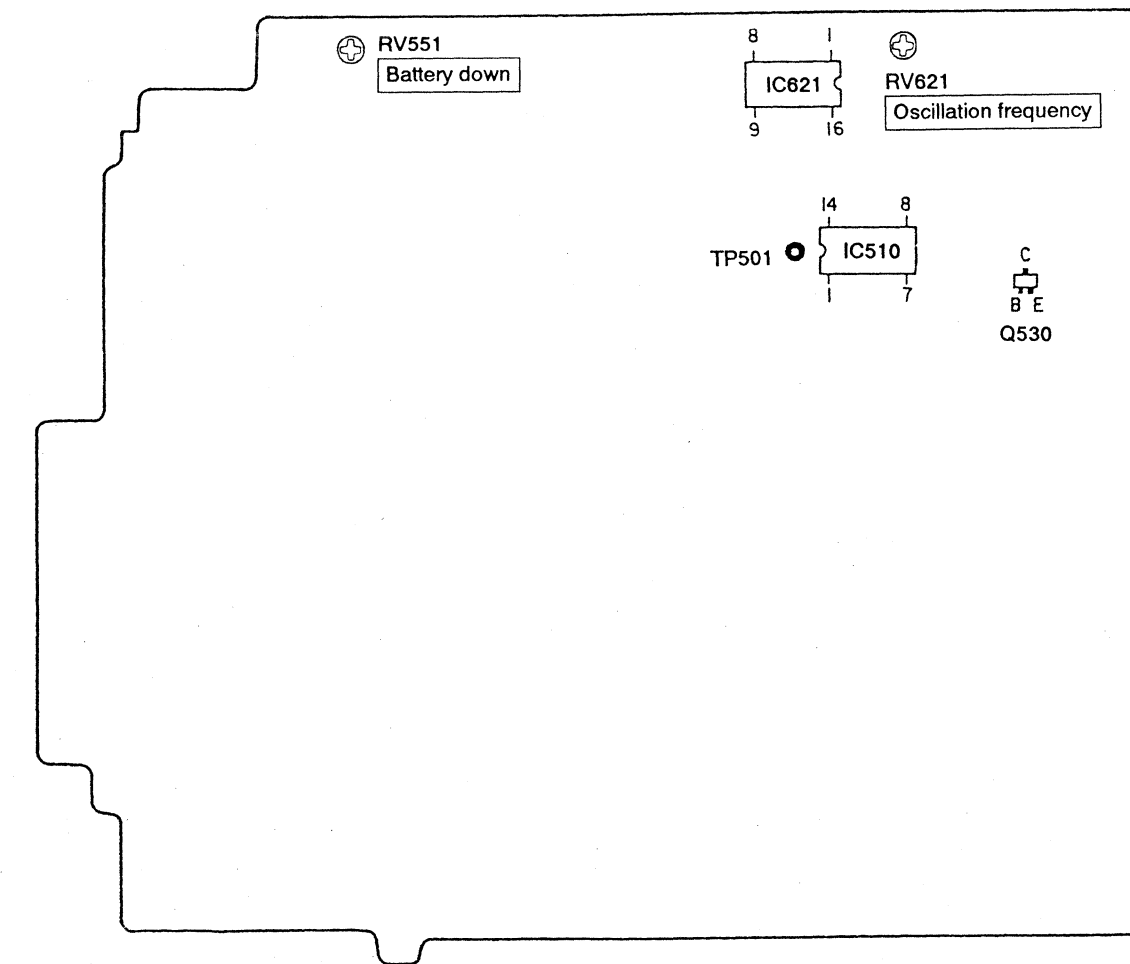
CK-19 BOARD (COMPONENT SIDE)



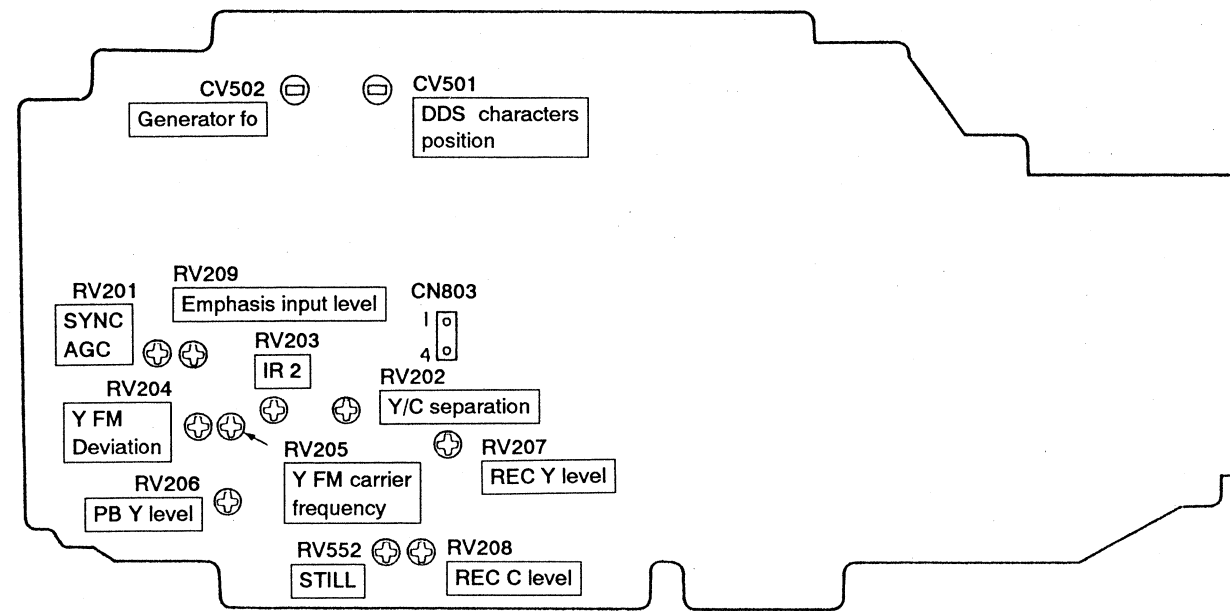
CO-2 BOARD (CONDUCTOR SIDE)



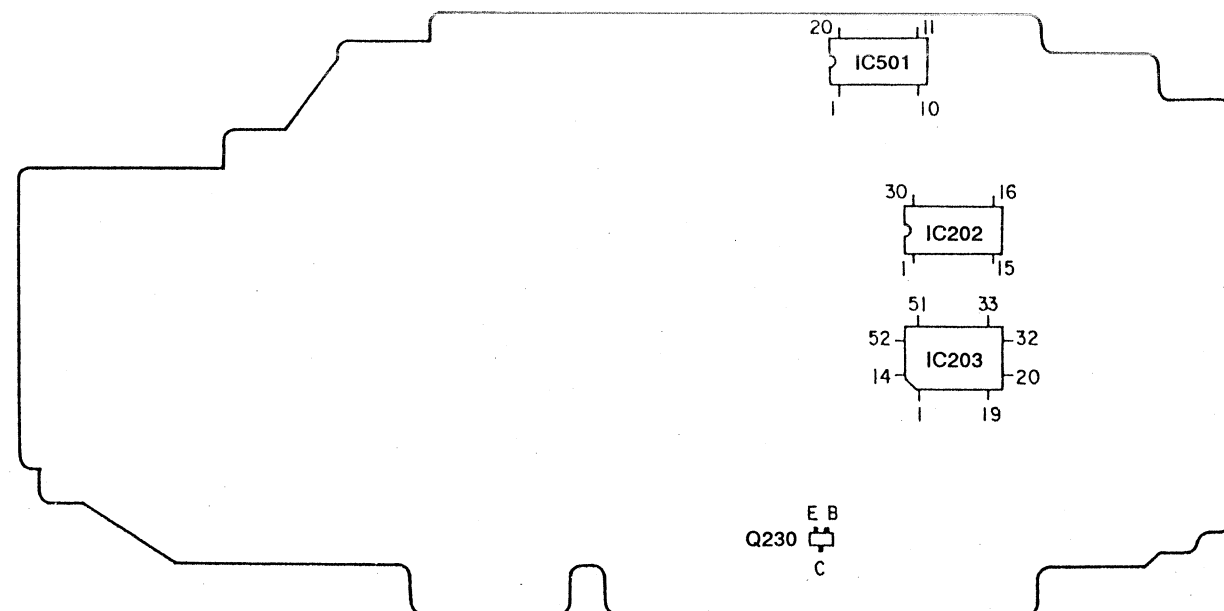
CO-2 BOARD (COMPONENT SIDE)

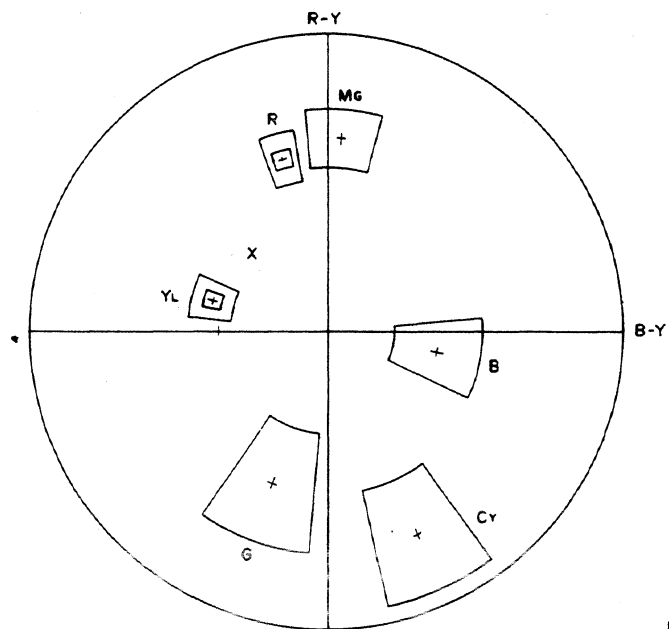


CV-8 BOARD (COMPONENT SIDE)

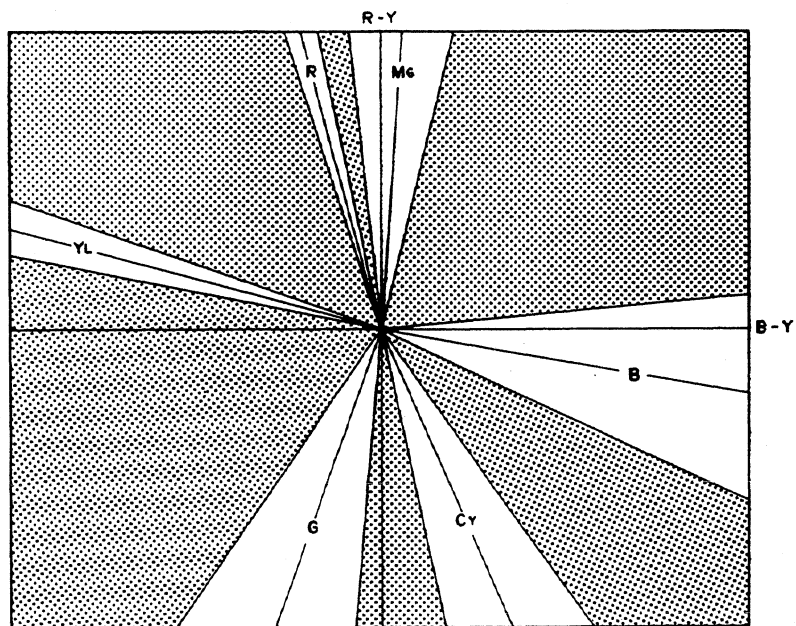


CV-8 BOARD (CONDUCTOR SIDE)





For Vectorscope



For Oscilloscope

CCD-F45/F46
CCD-F380
CCD-F360



CCD-F45/F46/F360

SONY SERVICE MANUAL

US Model
CCD-F45/F46
Canadian Model
CCD-F45
E Model
CCD-F360

SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : CRT change of type B viewfinder
(CCD-F45 only)

- CRT of type B viewfinder is changed from Serial No.77930 and later(CCD-F45).
According to this change, some parts mounted on VF-22 board are also changed.
- VF-22 board has already been changed from part number suffix -11 to -12.
This Supplement-1 also contains it.

CORRECTION

Page. 227

7-2-31. Auto-Focus Adjustment

1. Adjustment in all black pattern (CV-8 board)

4) When $FHB > 0$

$D42 = FHB + 2$

 : corrected portion.

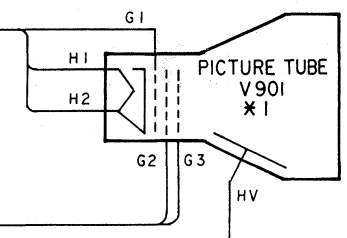
— Ref. No. VF-22 BOARD: 4000 series, LD-17 BOARD: 5000 series —

Figure 1 displays five waveform diagrams for IC901, each labeled with a number in a circle and a corresponding IC901 label in a circle.

- 1** IC901 (3): A sawtooth waveform with period V and peak-to-peak voltage $2V_{p-p}$.
- 2** IC901 (5): A sawtooth waveform with period V and peak-to-peak voltage $2V_{p-p}$.
- 3** IC901 (9): A complex waveform with period H and peak-to-peak voltage $0.9V_{p-p}$.
- 4** IC901 (11): A complex waveform with period H and peak-to-peak voltage $2.8V_{p-p}$.
- 5** IC901 (14): A complex waveform with period H and peak-to-peak voltage $2V_{p-p}$.

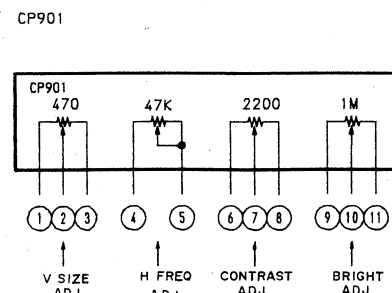
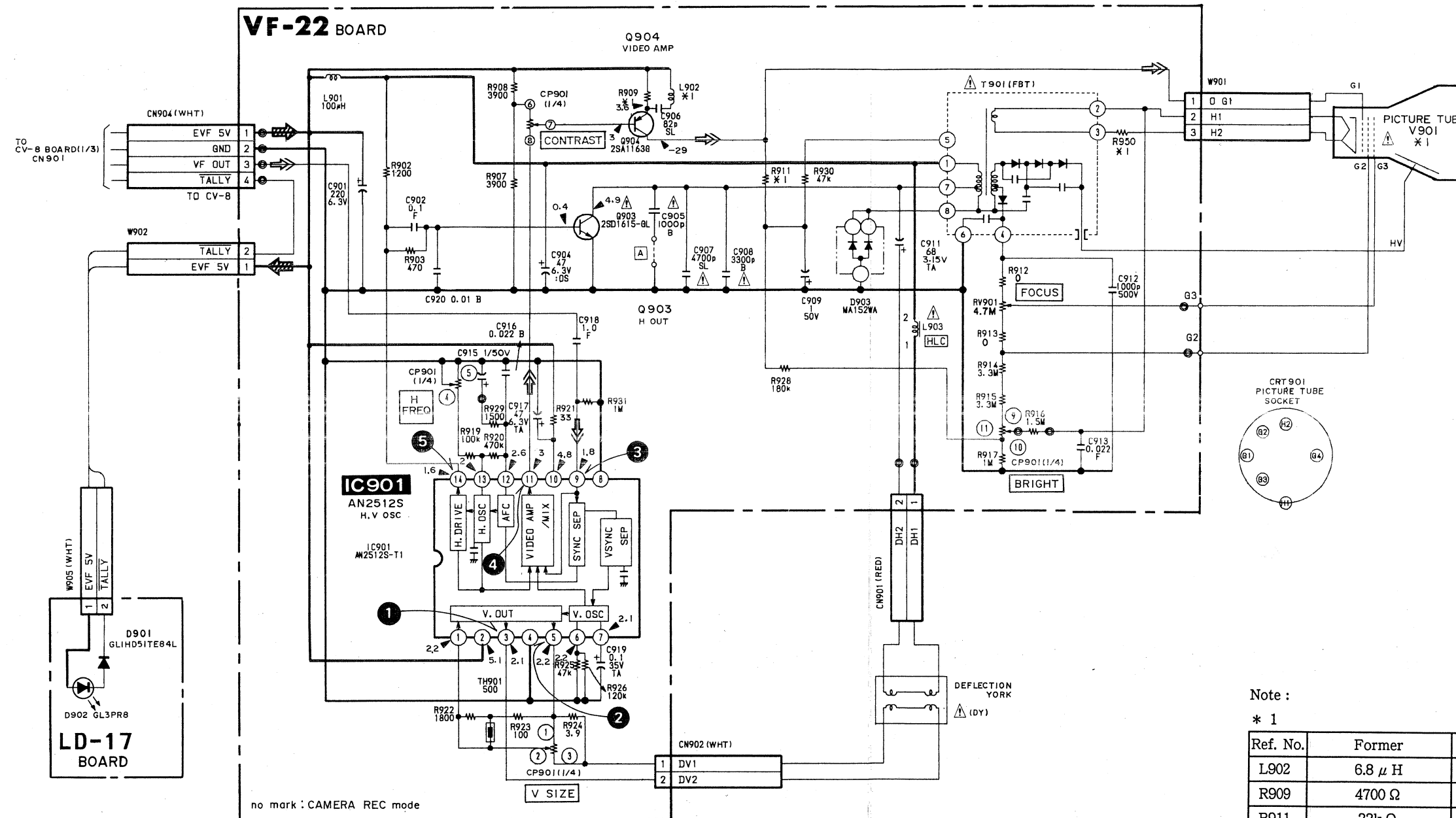
VF-22 BOARD (COMPONENT SIDE)

This diagram shows the component side of the VF-22 board. It includes various electronic components such as capacitors (C901, C902, C903, C904, C905, C906, C907, C908, C909, C910, C911, C912, C913, C914, C915, C916, C917, C918, C919, C920, C921, C922, C923, C924, C925, C926, C927, C928, C929, C930, C931, C932, C933, C934, C935, C936, C937, C938, C939, C940, C941, C942, C943, C944, C945, C946, C947, C948, C949, C950, C951, C952, C953, C954, C955, C956, C957, C958, C959, C960, C961, C962, C963, C964, C965, C966, C967, C968, C969, C970, C971, C972, C973, C974, C975, C976, C977, C978, C979, C980, C981, C982, C983, C984, C985, C986, C987, C988, C989, C990, C991, C992, C993, C994, C995, C996, C997, C998, C999, C1000), resistors (R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000), inductors (L901, L902, L903, L904, L905, L906, L907, L908, L909, L910, L911, L912, L913, L914, L915, L916, L917, L918, L919, L920, L921, L922, L923, L924, L925, L926, L927, L928, L929, L930, L931, L932, L933, L934, L935, L936, L937, L938, L939, L940, L941, L942, L943, L944, L945, L946, L947, L948, L949, L950, L951, L952, L953, L954, L955, L956, L957, L958, L959, L960, L961, L962, L963, L964, L965, L966, L967, L968, L969, L970, L971, L972, L973, L974, L975, L976, L977, L978, L979, L980, L981, L982, L983, L984, L985, L986, L987, L988, L989, L990, L991, L992, L993, L994, L995, L996, L997, L998, L999, L1000), and transistors (T901, T902, T903, T904, T905, T906, T907, T908, T909, T910, T911, T912, T913, T914, T915, T916, T917, T918, T919, T920, T921, T922, T923, T924, T925, T926, T927, T928, T929, T930, T931, T932, T933, T934, T935, T936, T937, T938, T939, T940, T941, T942, T943, T944, T945, T946, T947, T948, T949, T950, T951, T952, T953, T954, T955, T956, T957, T958, T959, T960, T961, T962, T963, T964, T965, T966, T967, T968, T969, T970, T971, T972, T973, T974, T975, T976, T977, T978, T979, T980, T981, T982, T983, T984, T985, T986, T987, T988, T989, T990, T991, T992, T993, T994, T995, T996, T997, T998, T999, T1000). The board is labeled with 'VF-22 BOARD (COMPONENT SIDE)' and '1-630-066-12'.



VF-22 (ELECTRONIC VIEW FIDER), LD-17 (TALLY LED) SCHEMATIC DIAGRAMS

— Ref. No. VF-22 BOARD: 4000 series, LD-17 BOARD: 5000 series —



Note :

* 1

Ref. No.	Former	New
L902	6.8 μ H	22 μ H
R909	4700 Ω	3300 Ω
R911	22k Ω	18k Ω
R950	0 Ω	6.8 Ω
V901	M01JVV47WB	M01KGG007WB

• Signal path

	VIDEO Signal			AUDIO Signal
	CHROMA	Y	Y/CHROMA	
REC				
PB		⇒		

Exploded view diagram of a mechanical assembly. The diagram shows various components and their assembly sequence, indicated by numbers and leader lines. Key components and instructions include:

- 80**: Main housing or frame.
- 51**: Upper cover or plate.
- 52**: Small pin or clip.
- 55**: Screw or fastener.
- 56**: Small bracket or clip.
- 57**: Small pin or clip.
- 53**: Small bracket or clip.
- 54**: Small pin or clip.
- 59**: Curved bracket or support.
- 60**: Small bracket or clip.
- 64**: Small bracket or clip.
- 61**: Small pin or clip.
- 62**: STAINLESS BALL (indicated by a dotted line with a triangle mark).
- 63**: Small bracket or clip.
- 68**: Small pin or clip.
- 69**: Small pin or clip.
- 70**: Small pin or clip.
- 71**: Small pin or clip.
- 72**: Small pin or clip.
- 73**: Small pin or clip.
- 74**: Small pin or clip.
- 75**: Small pin or clip.
- 76**: Small pin or clip.
- 77**: Small pin or clip.
- 78**: Small pin or clip.
- 79**: Small pin or clip.
- 81**: Small pin or clip.
- not supplied**: Indicated for several components (63, 70, 62, 67).

The diagram is divided into several sections by dashed lines, indicating different sub-assemblies or stages of assembly. A legend at the bottom right states: "The components identified by mark or dotted line with mark

Les composants identifiés par une
marque  sont critiques pour la
sécurité.
Ne les remplacer que par une
pièce portant le numéro spécifié.

No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	X-3733-925-1	CARINET (UPPER) ASSY (CCD-F45/F360)	52-57	66	△.1-439-428-11	TRANSFORMER ASSY, FLYBACK (T901)	
	X-3733-945-1	CARINET (UPPER) ASSY (CCD-F46)	52-57	67	*1-630-067-11	LD-17 BOARD	
52	3-732-919-01	BUTTON, EJECT (CCD-F45/F360)		68	△.1-451-310-21	DEFLECTION YOKE (B/W)	
	*3-732-919-11	BUTTON, EJECT (CCD-F46)		69	3-724-549-01	LOCK, CRT	
53	3-732-920-01	LOCK, EJECT		70	△.1-546-065-11	CATHODE-RAY TUBE, B/W (FORMER TYPE)	
54	3-669-440-00	SPRING, TENSION			△.1-546-085-11	CATHODE-RAY TUBE, B/W (NEW TYPE)	
55	3-719-381-01	SCREW (M2X4)		71	3-724-570-01	RING, CRT FIXED	
56	3-718-226-01	BUTTON, POWER		72	X-3724-509-1	HOLDER ASSY, CRT	
57	*3-718-257-11	BUTTON, PUSH, POWER		73	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	74
58	*3-732-944-01	BEARING, EVF		74	3-733-922-01	EYE CUP	
59	3-732-950-01	BLIND, EVF		75	3-732-948-01	CABINET (UPPER), EVF	
60	3-732-949-01	BLIND, EVF CABINET (LOWER)		76	3-713-790-31	SCREW (M2X8), TAPPING, P3	
61	3-732-947-01	PLATE, LOCK		77	X-3732-911-1	CABINET (LOWER) ASSY, EVF	
62	3-732-946-01	SPRING, COMPRESSION		78	3-703-848-01	LABEL (N), SUB CAUTION	
63	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE		79	3-732-988-01	SCREW (M2X2.5)	
64	3-732-987-01	SCREW (M2X20), +P		80	A-7019-151-A	EVF COMPLETE ASSY (FORMER TYPE)	58-78, 81
65	*A-7061-558-A	VF-22 BOARD, COMPLETE (FORMER TYPE)	66, 67, 81		A-7019-151-B	EVF COMPLETE ASSY (NEW TYPE)	58-78, 81
	*A-7061-558-B	VF-22 BOARD, COMPLETE (NEW TYPE)	66, 67, 81	81	△.1-526-978-21	SOCKET ASSY, CRT (CRT901)	

Ref.No	Part No	Description	Remark	Ref.No	Part No	Description	Remark
*A-7061-558-A	VF-22 BOARD, COMPLETE (FORMER TYPE)			R912	1-216-295-00	METAL GLAZE	0 5% 1/10W
	***** (Ref.No 4,000 Series)			R913	1-216-295-00	METAL GLAZE	0 5% 1/10W
*A-7061-558-B	VF-22 BOARD, COMPLETE (NEW TYPE)			R914	1-216-133-00	METAL GLAZE	3.3M 5% 1/10W
	***** (Ref.No 4,000 Series)			R915	1-216-133-00	METAL GLAZE	3.3M 5% 1/10W
				R916	1-216-125-00	METAL GLAZE	1.5M 5% 1/10W
<u>CAPACITOR</u>				R917	1-216-121-00	METAL GLAZE	1M 5% 1/10W
C901	1-126-369-11	ELECT 220MF	20% 6.3V	R919	1-216-097-00	METAL GLAZE	100K 5% 1/10W
C902	1-163-038-00	CERAMIC CHIP 0.1MF	25V	R920	1-216-113-00	METAL GLAZE	470K 5% 1/10W
C904	1-127-515-11	ELECT(SOLID) 47MF	20% 6.3V	R921	1-216-013-00	METAL GLAZE	33 5% 1/10W
C905	1-163-009-11	CERAMIC CHIP 0.001MF	10% 50V	R922	1-216-055-00	METAL GLAZE	1.8K 5% 1/10W
C906	1-163-115-00	CERAMIC CHIP 82PF	5% 50V	R923	1-216-025-00	METAL GLAZE	100 5% 1/10W
C907	1-162-625-11	CERAMIC CHIP 0.0047MF	5% 50V	R924	1-216-306-11	METAL GLAZE	3.9 5% 1/10W
C908	1-163-015-00	CERAMIC CHIP 0.0033MF	10% 50V	R925	1-216-336-11	METAL GLAZE	47K 1% 1/10W
C909	1-126-193-11	ELECT CHIP 1MF	20% 50V	R926	1-218-163-11	METAL GLAZE	120K 1% 1/10W
C911	1-131-388-00	TANTALUM 68MF	10% 3.15V	R928	1-216-870-11	METAL GLAZE	180K 1% 1/10W
C912	1-102-038-00	CERAMIC 0.001MF	500V	R929	1-216-053-00	METAL GLAZE	1.5K 5% 1/10W
C913	1-163-033-00	CERAMIC CHIP 0.022MF	50V	R930	1-216-089-00	METAL GLAZE	47K 5% 1/10W
C915	1-126-193-11	ELECT CHIP 1MF	20% 50V	R931	1-216-121-00	METAL GLAZE	1M 5% 1/10W
C916	1-163-037-11	CERAMIC CHIP 0.022MF	10% 25V	R950	1-216-295-00	METAL GLAZE	0 5% 1/10W (FORMER TYPE)
C917	1-135-166-21	TANTAL. CHIP 47MF	20% 6.3V	R950	1-216-311-00	METAL GLAZE	6.8 5% 1/10W (NEW TYPE)
C918	1-162-638-11	CERAMIC CHIP 1MF	16V				
C919	1-135-070-00	TANTAL. CHIP 0.1MF	10% 35V				
C920	1-164-232-11	CERAMIC CHIP 0.01MF	10% 50V				
<u>CONNECTOR</u>							
CN901	*1-566-195-21	PIN, CONNECTOR (PC BOARD) 2P					
CN902	*1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P					
CN904	*1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P					
<u>COMPOSITION CIRCUIT BLOCK</u>							
CP901	1-238-119-11	RES, ADJ					
<u>SOCKET</u>							
CRT901	1-526-978-21	SOCKET ASSY, CRT					
<u>DIODE</u>							
D903	8-719-400-20	DIODE MAT52WA					
<u>IC</u>							
IC901	8-759-420-01	IC AN2512S					
<u>COIL</u>							
L901	1-408-421-00	INDUCTOR 100UH					
L902	1-410-379-21	INDUCTOR CHIP 6.8UH (FORMER TYPE)					
L902	1-410-385-11	INDUCTOR CHIP 22UH (NEW TYPE)					
L903	1-459-858-11	COIL, FERRITE (HLC)					
<u>TRANSISTOR</u>							
Q902	8-729-402-31	TRANSISTOR 2SD1819A-Q					
Q903	8-729-106-68	TRANSISTOR 2SD1615A-GP					
Q904	8-729-216-32	TRANSISTOR 2SA1163					
<u>RESISTOR</u>							
R902	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W				
R903	1-216-041-00	METAL GLAZE 470 5%	1/10W				
R904	1-216-073-00	METAL GLAZE 10K 5%	1/10W				
R906	1-216-051-00	METAL GLAZE 1.2K 5%	1/10W				</

Les composants identifiés par une marque  sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

CCD-F45/F46/F360

SONY SERVICE MANUAL

US Model
CCD-F45/F46

Canadian Model
CCD-F45

E Model
CCD-F360

SUPPLEMENT-1

File this supplement with the Service Manual.

Subject : CRT change of type B viewfinder
(CCD-F45 only)

- CRT of type B viewfinder is changed from Serial No.77930 and later(CCD-F45).
According to this change, some parts mounted on VF-22 board are also changed.
- VF-22 board has already been changed from part number suffix -11 to -12.
This Supplement-1 also contains it.

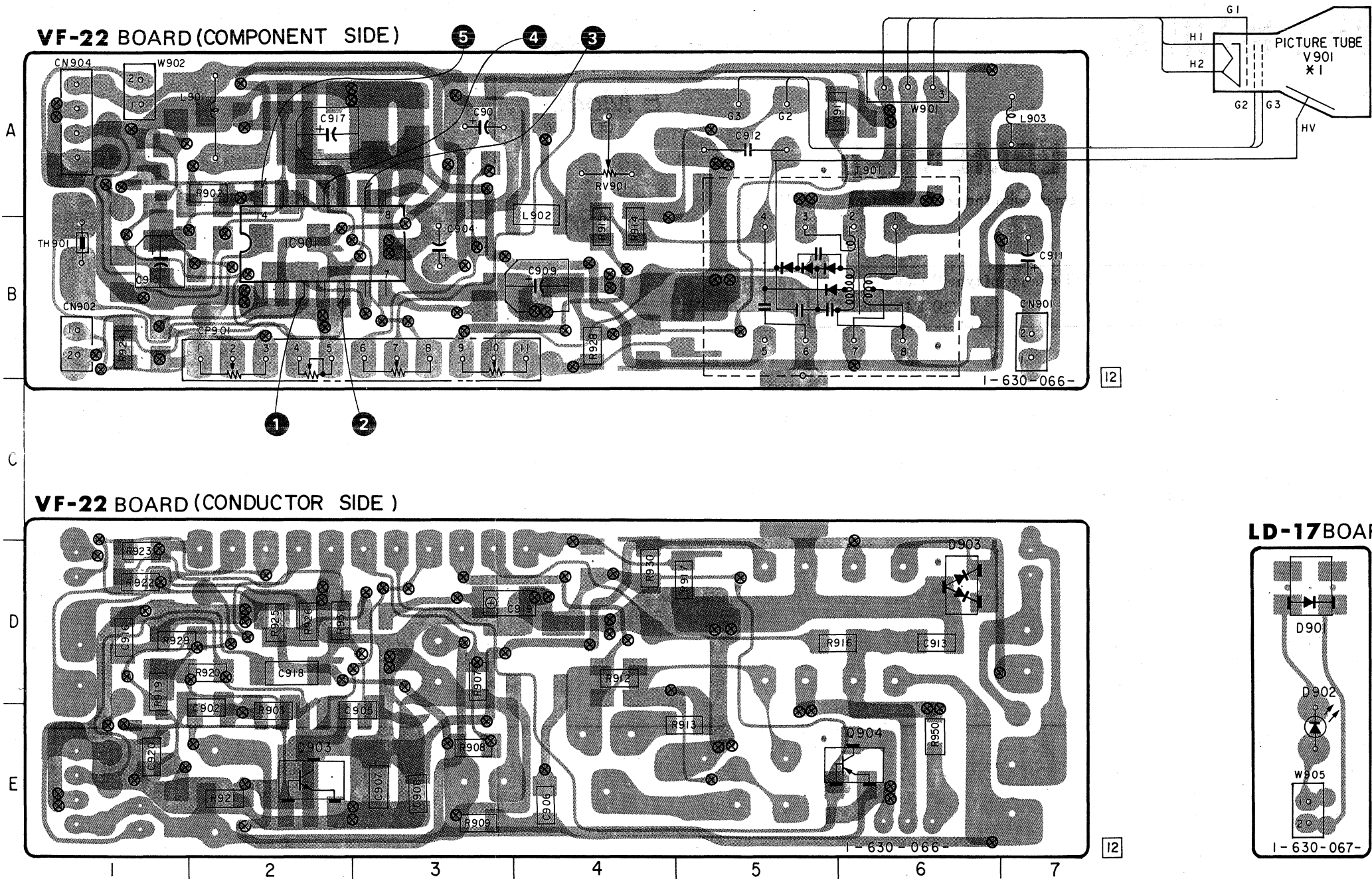
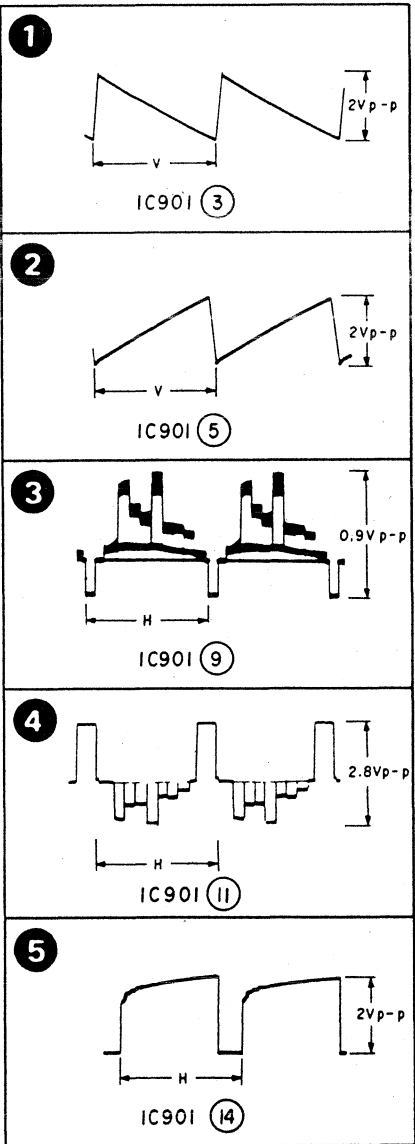
VF-22 (ELECTRONIC VIEW FIDER), LD-17 (TALLY LED) PRINTED WIRING BOARDS

— Ref. No. VF-22 BOARD: 4000 series, LD-17 BOARD: 5000 series —

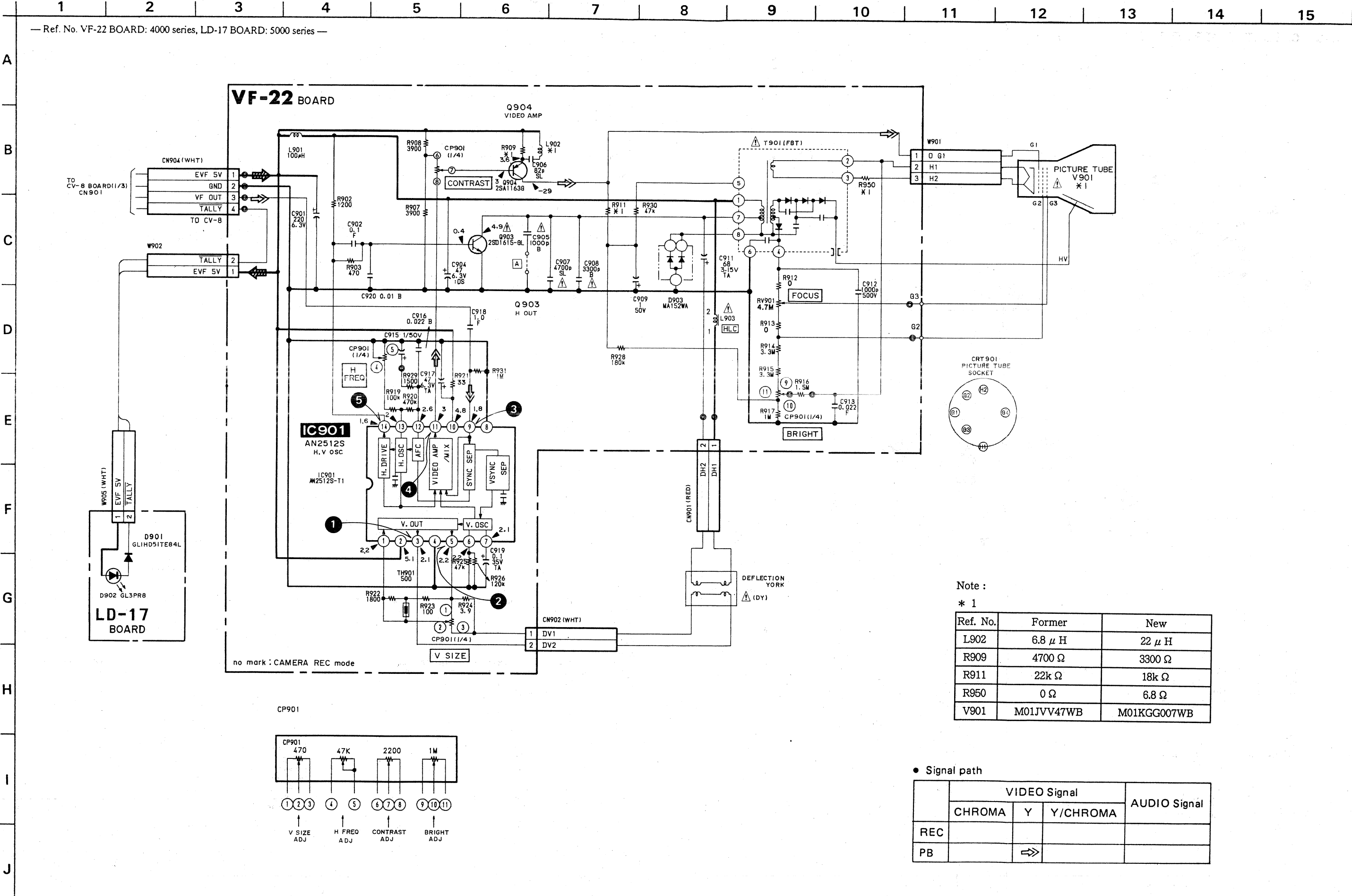
VF-22 BOARD

D903	D-6
IC901	B-2
Q902	A-1
Q903	E-2
Q904	E-6

VF-22 BOARD

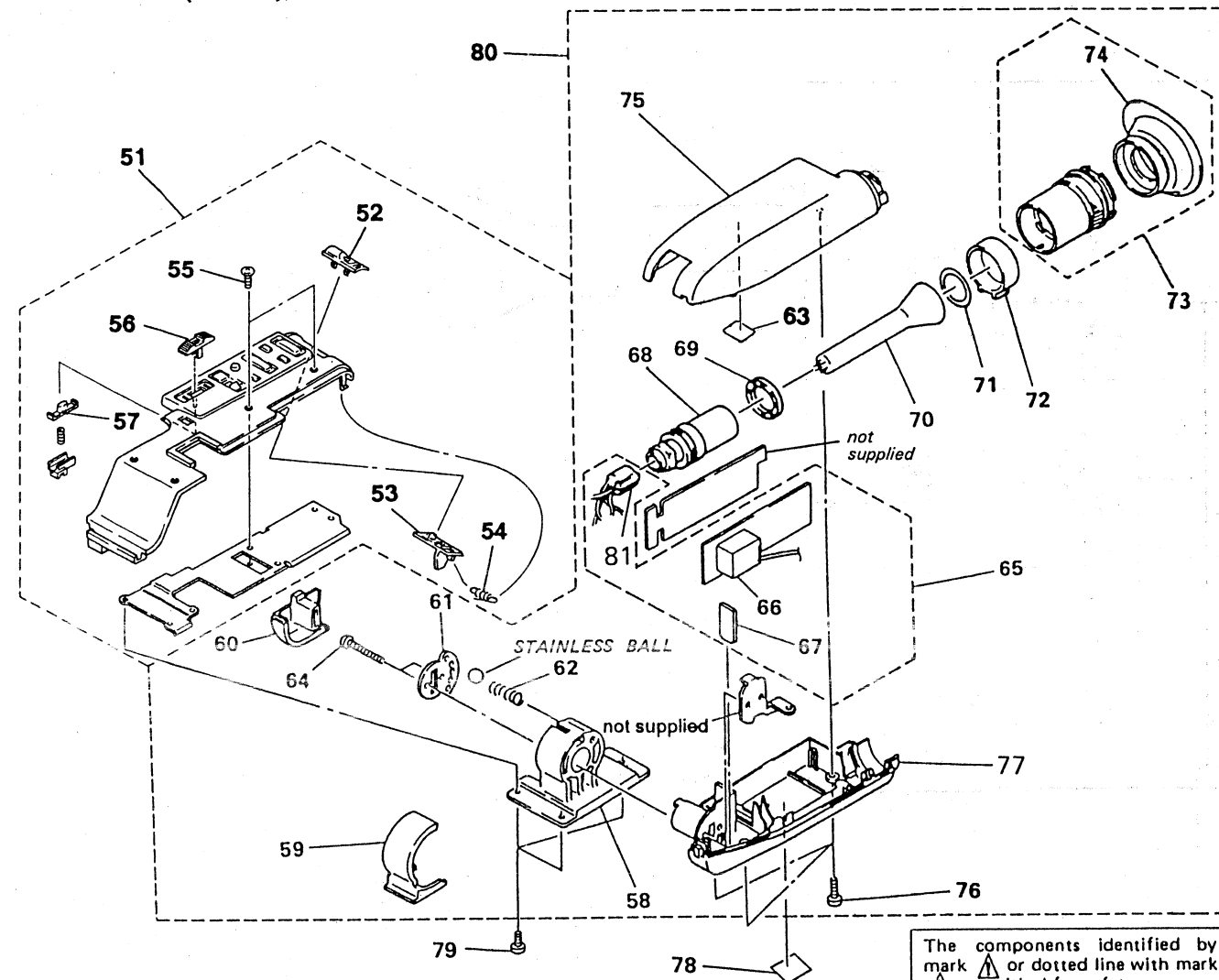


VF-22 (ELECTRONIC VIEW FIDER), LD-17 (TALLY LED) SCHEMATIC DIAGRAMS



VF-22	LD-17
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5-3. CABINET (UPPER), EVF ASSEMBLY (TYPE B)



The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
51	X-3733-925-1	CABINET (UPPER) ASSY (CCD-F45/F360)	52-57	66	△.1-439-428-11	TRANSFORMER ASSY, FLYBACK (T901)	
	X-3733-945-1	CABINET (UPPER) ASSY (CCD-F46)	52-57	67	*1-630-067-11	LD-17 BOARD	
52	3-732-919-01	BUTTON, EJECT (CCD-F45/F360)		68	△.1-451-310-21	DEFLECTION YOKE (B/W)	
	*3-732-919-11	BUTTON, EJECT (CCD-F46)		69	3-724-549-01	LOCK, CRT	
53	3-732-920-01	LOCK, EJECT		70	△.1-546-065-11	CATHODE-RAY TUBE, B/W (FORMER TYPE)	
54	3-669-440-00	SPRING, TENSION			△.1-546-085-11	CATHODE-RAY TUBE, B/W (NEW TYPE)	
55	3-719-381-01	SCREW (M2X4)		71	3-724-570-01	RING, CRT FIXED	
56	3-718-226-01	BUTTON, POWER		72	X-3724-509-1	HOLDER ASSY, CRT	
57	*3-718-257-11	BUTTON, PUSH, POWER		73	A-7080-715-A	HOLDER BLOCK ASSY, FINDER	74
58	*3-732-944-01	BEARING, EVF		74	3-733-922-01	EYE CUP	
59	3-732-950-01	BLIND, EVF		75	3-732-948-01	CABINET (UPPER), EVF	
60	3-732-949-01	BLIND, EVF CABINET (LOWER)		76	3-713-790-31	SCREW (M2X8), TAPPING, P3	
61	3-732-947-01	PLATE, LOCK		77	X-3732-911-1	CABINET (LOWER) ASSY, EVF	
62	3-732-946-01	SPRING, COMPRESSION		78	3-703-848-01	LABEL (N), SUB CAUTION	
63	3-704-233-01	LABEL, CAUTION, HIGH VOLTAGE		79	3-732-988-01	SCREW (M2X2.5)	
64	3-732-987-01	SCREW (M2X20), +P		80	A-7019-151-A	EVF COMPLETE ASSY (FORMER TYPE)	58-78, 81
65	*A-7061-558-A	VF-22 BOARD, COMPLETE (FORMER TYPE)	66, 67, 81		A-7019-151-B	EVF COMPLETE ASSY (NEW TYPE)	58-78, 81
	*A-7061-558-B	VF-22 BOARD, COMPLETE (NEW TYPE)	66, 67, 81	81	△.1-526-978-21	SOCKET ASSY, CRT (CRT901)	

Ref.No

Part No.

Description

Remark

*A-7061-558-A

VF-22 BOARD, COMPLETE (FORMER TYPE)

***** (Ref.No 4,000 Series)

*A-7061-558-B

VF-22 BOARD, COMPLETE (NEW TYPE)

***** (Ref.No 4,000 Series)

CAPACITOR

C9011-126-369-11ELECT220MF20%6.3V

C9021-163-038-00CERAMIC CHIP0.1MF25V

C9041-127-515-11ELECT(SOLID)47MF20%6.3V

C905Δ.1-163-009-11CERAMIC CHIP0.001MF10%50V

C9061-163-115-00CERAMIC CHIP82PF5%50V

C907Δ.1-162-625-11CERAMIC CHIP0.0047MF5%50V

C908Δ.1-163-015-00CERAMIC CHIP0.0033MF10%50V

C9091-126-193-11ELECT CHIP1MF20%50V

C9111-131-388-00TANTALUM68MF10%3.15V

C9121-102-038-00CERAMIC0.001MF500V

C9131-163-033-00CERAMIC CHIP0.022MF50V

C9151-126-193-11ELECT CHIP1MF20%50V

C9161-163-037-11CERAMIC CHIP0.022MF10%25V

C9171-135-166-21TANTAL. CHIP47MF20%6.3V

C9181-162-638-11CERAMIC CHIP1MF16V

C9191-135-070-00TANTAL. CHIP0.1MF10%35V

C9201-164-232-11CERAMIC CHIP0.01MF10%50V

CONNECTOR

CN901*1-566-195-21PIN, CONNECTOR (PC BOARD) 2P

CN902*1-566-195-11PIN, CONNECTOR (PC BOARD) 2P

CN904*1-566-759-11PIN, CONNECTOR (PC BOARD) 4P

COMPOSITION CIRCUIT BLOCK

CP9011-238-119-11RES, ADJ

SOCKET

CRT9011-526-978-21SOCKET ASSY, CRT

DIODE

D9038-719-400-20DIODE MA152WA

IC

IC9018-759-420-01IC AN2512S

COIL

L9011-408-421-00INDUCTOR100UH

L9021-410-379-21INDUCTOR CHIP6.8UH (FORMER TYPE)

L9021-410-385-11INDUCTOR CHIP22UH (NEW TYPE)

L903Δ.1-459-858-11COIL, FERRITE (HLC)

TRANSISTOR

Q9028-729-402-31TRANSISTOR 2SD1819A-Q

Q903Δ.8-729-106-68TRANSISTOR 2SD1615A-GP

Q9048-729-216-32TRANSISTOR 2SA1163

RESISTOR

R9021-216-051-00METAL GLAZE1.2K5%1/10W

R9031-216-041-00METAL GLAZE4705%1/10W

R9041-216-073-00METAL GLAZE10K5%1/10W

R9061-216-051-00METAL GLAZE1.2K5%1/10W

R9071-216-063-00METAL GLAZE3.9K5%1/10W

R9081-216-063-00METAL GLAZE3.9K5%1/10W

R9091-216-065-00METAL GLAZE4.7K5%1/10W (FORMER TYPE)

R9091-216-061-00METAL GLAZE18K5%1/10W (NEW TYPE)

R9111-216-081-00METAL GLAZE22K5%1/10W (FORMER TYPE)

R9111-216-079-00METAL GLAZE3.3K5%1/10W (NEW TYPE)

Ref.No

Part No.

Description

Remark

R9121-216-295-00METAL GLAZE05%1/10W

R9131-216-295-00METAL GLAZE05%1/10W

R9141-216-133-00METAL GLAZE3.3M5%1/10W

R9151-216-133-00METAL GLAZE3.3M5%1/10W

R9161-216-125-00METAL GLAZE1.5M5%1/10W

R9171-216-121-00METAL GLAZE1M5%1/10W

R9191-216-097-00METAL GLAZE100K5%1/10W

R9201-216-113-00METAL GLAZE470K5%1/10W

R9211-216-013-00METAL GLAZE335%1/10W

R9221-216-055-00METAL GLAZE1.8K5%1/10W

R9231-216-025-00METAL GLAZE1005%1/10W

R9241-216-306-11METAL GLAZE3.95%1/10W

R9251-216-336-11METAL GLAZE47K1%1/10W

R9261-218-163-11METAL GLAZE120K1%1/10W

R9281-216-870-11METAL GLAZE180K1%1/10W

R9291-216-053-00METAL GLAZE1.5K5%1/10W

R9301-216-089-00METAL GLAZE47K5%1/10W

R9311-216-121-00METAL GLAZE1M5%1/10W

R9501-216-295-00METAL GLAZE05%1/10W (FORMER TYPE)

R9501-216-311-00METAL GLAZE6.85%1/10W (NEW TYPE)

VARIABLE RESISTOR

RV9011-238-647-11RES, ADJ, METAL GLAZE 4.7M

TRANSFORMER

T901Δ.1-439-428-11TRANSFORMER ASSY, FLYBACK

THERMISTOR

TH9011-807-938-11THERMISTOR 500

*1-630-067-11LD-17 BOARD (Ref.No 5,000 Series)

*3-674-372-00HOLDER (A), LED

DIODE

D9018-719-941-34DIODE GL1HD51

D9028-719-812-41DIODE TLR124

MISCELLANEOUS

Δ.1-451-310-21DEFLECTION YOKE (B/W)

V901Δ.1-452-482-11CRT ASSY (M91JYZ60WB) (VF-14 BOARD)

V901Δ.1-546-065-11CATHODE-RAY TURE, B/W (M01JVV47WB) (FORMER TYPE) (VF-22 BOARD)

V901Δ.1-546-085-11CATHODE-RAY TUBE, B/W (M01KGG007WB) (NEW TYPE) (VF-22 BOARD)

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

CCD-F45/F46/F360

SONY[®] SERVICE MANUAL

US Model
CCD-F45/F46
Canadian Model
CCD-F45/F46
E Model
CCD-F360

CORRECTION-1

File this correction with the service manual.

Page. 228 7-2-31. Auto-Focus Adjustment

3. Adjustment in Siemens star (CV-8 board)

 : Corrected portion

INCORRECT	CORRECT
4) Read the AF jig indication, and call the data D, and then convert it to the decimal number D'. Then obtain FHSM' by the following formula: $FHSM' = D' / 2.5$ (FHSM' shall be within 16 to 55) 5) Select adjustment address 37 and input adjustment data FD with the adjustment remote controller (the auto-focus will be set to the FA side). 6) Read the AF jig indication, and call the data D, and then convert it to the decimal number D'. Then obtain FASM' by the following formula: $FASM' = D' / 1.6$ (FASM' shall be within 78 to 104)	4) Read the AF jig indication, and call the data FHSM, and then convert it to the decimal number FHSM'.  (FHSM' shall be within 16 to 55) 5) Select adjustment address 37 and input adjustment data FD with the adjustment remote controller (the auto-focus will be set to the FA side). 6) Read the AF jig indication, and call the data FASM, and then convert it to the decimal number FASM'.  (FASM' shall be within 78 to 104)

 : Corrected portion

INCORRECT	CORRECT												
1. Preset adjustment (CV-8 Board) Adjustment method: 6) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0. Wait at least five seconds. 2. Auto white balance adjustment (CV-8 Board) Adjustment method: 1) Select adjustment address 89 (AWB MODE) with the adjustment remote commander and enter adjustment data of 10. 15) Select adjustment address 89 and enter adjustment data 00. 16) Select adjustment address 89 and enter adjustment data F0. 17) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote commander to move the white luminance point and black luminance point. (Move the white luminance point to the origin point when using the vectorscope.) 18) Select adjustment address 89 and enter adjustment data of 00. 19) Change the adjustment address to store the adjustment data in the memory. (Example) When the adjustment data obtained in Step 2) has the following values. <table border="1"> <thead> <tr> <th>Adjustment address</th><th>Adjustment data</th></tr> </thead> <tbody> <tr> <td>01</td><td>2A</td></tr> <tr> <td>02</td><td>53</td></tr> </tbody> </table> → Enter into adjustment address 80 → Enter into adjustment address 81 $D_1=2A$ and $D_2=53$ when there is conversion to decimal using Table 7-5. $D_1'=42$ $D_2'=83$ Thus, $D_{77}'=(83 \times 1.9)-43.2=114.5$ Rounding off the decimal portion and converting to hexadecimal by Table 7-5 results in, $D_{77}=72 \rightarrow$ Entered into adjustment address 77	Adjustment address	Adjustment data	01	2A	02	53	1. Preset adjustment (CV-8 Board) Adjustment method: 6) Select adjustment address 89 (AWB MODE) and set the adjustment data to E0.  2. Auto white balance adjustment (CV-8 Board) Adjustment method: 1) Select adjustment address 89 (AWB MODE) with the adjustment remote commander and enter adjustment data of 10. And cover the lens with the filter C14.  15) Select adjustment address 89 and enter adjustment data F0.  16) Change the adjustment data of adjustment addresses 01 and 02 with the adjustment remote commander to move the white luminance point and black luminance point. (Move the white luminance point to the origin point when using the vectorscope.) 17) Select adjustment address 89 and enter adjustment data of 00. 18) Remove the filter C14.  19) Change the adjustment address to store the adjustment data in the memory. (Example) When the adjustment data obtained in Step 2) has the following values. <table border="1"> <thead> <tr> <th>Adjustment address</th><th>Adjustment data</th></tr> </thead> <tbody> <tr> <td>01</td><td>2A</td></tr> <tr> <td>02</td><td>53</td></tr> </tbody> </table> → Entered into adjustment address 78 $D_1=2A$ and $D_2=53$ when there is conversion to decimal using Table 7-5. $D_1'=42$ $D_2'=83$ Thus, $D_{80}'=42+1=43$  $D_{81}'=83+3=86$  $D_{77}'=(83 \times 1.9)-43.2=114.5$ Rounding off the decimal portion and converting to hexadecimal by Table 7-5 results in, $D_{80}=2B \rightarrow$ Entered into adjustment address 80.  $D_{81}=56 \rightarrow$ Entered into adjustment address 81.  $D_{77}=72 \rightarrow$ Entered into adjustment address 77.	Adjustment address	Adjustment data	01	2A	02	53
Adjustment address	Adjustment data												
01	2A												
02	53												
Adjustment address	Adjustment data												
01	2A												
02	53												

CCD-F45/F46

SONY[®] SERVICE MANUAL

SUPPLEMENT-1

US Model

CCD-F45/F46

Canadian Model

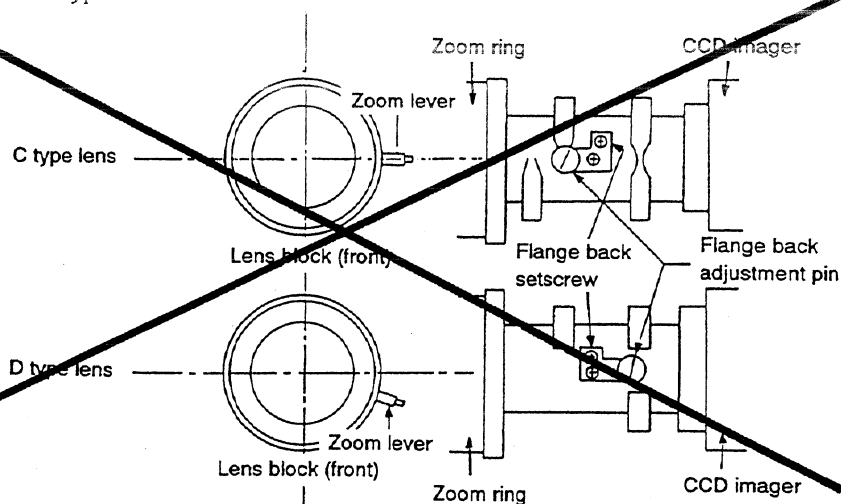
CCD-F46

Subject : Parts List of Lens Block addition

There is only one type (C type) in lens block of CCD-F45/F46.

Therefore, delete the following portion of CAUTION on Service manual page 5.

2. In the lens block, C or D type used.



EXPLODED VIEW

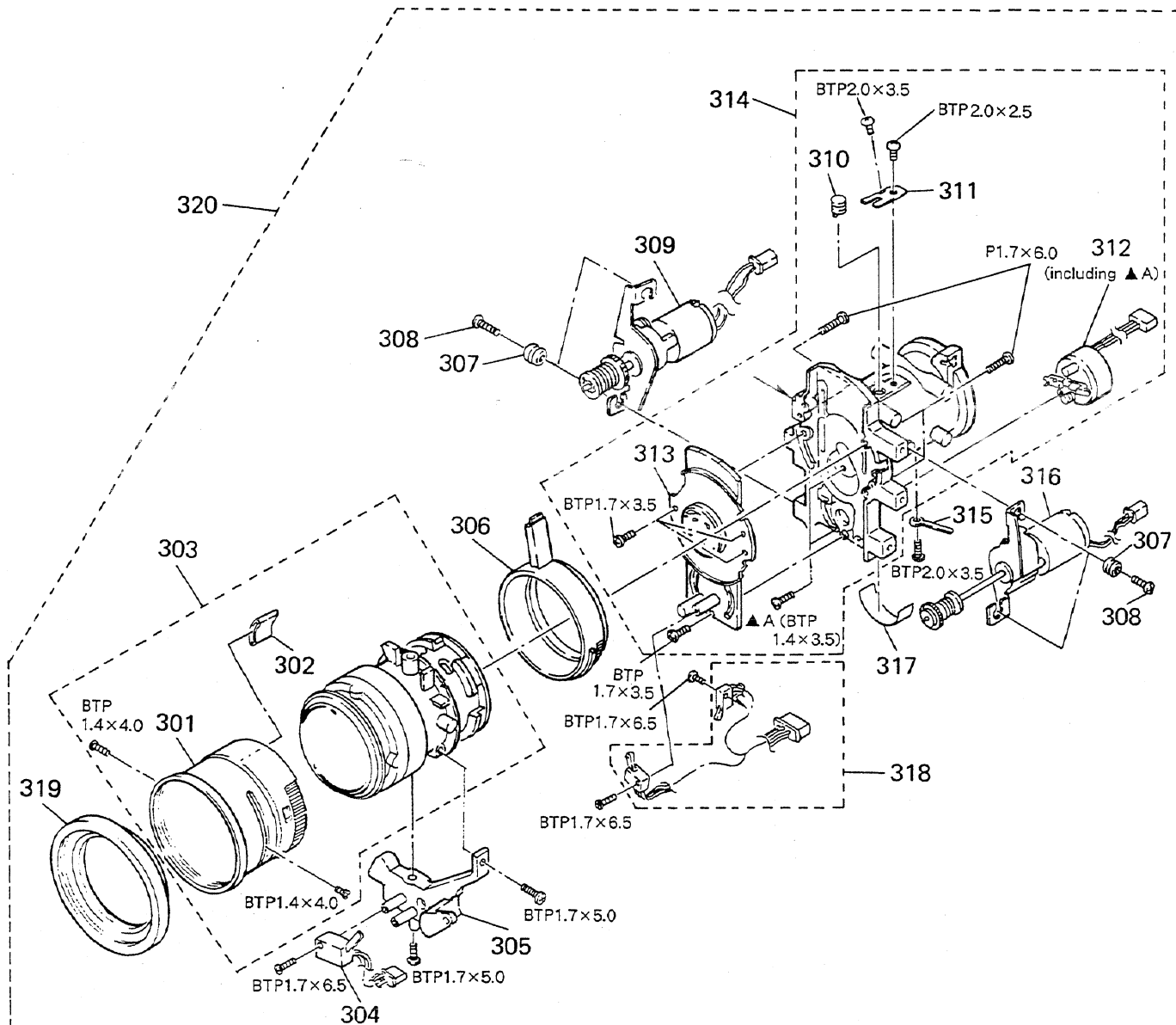
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

LENS BLOCK



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
301	3-707-812-01	RING (F)		311	3-707-798-01	CLAMP, PIN	
302	3-707-801-01	RUBBER, STOPPER (F)		312	3-707-810-01	METER, IRIS	
303	3-707-808-01	TUBE ASSY	301, 302	313	3-707-809-01	FRAME ASSY, LENS	
304	3-707-805-01	SWITCH ASSY, AF		314	3-707-807-01	TUBE ASSY, REAR	310-313
305	3-707-806-01	BRACKET		315	3-707-799-01	PLATE, LUG	
306	3-707-811-01	RING ASSY, ZOOM		316	3-707-803-01	MOTOR ASSY, AF GEAR	
307	3-707-795-01	RUBBER, VIBRATION PROOF		317	3-707-800-01	TAPE	
308	3-707-796-01	SCREW, FITTING (M)		318	3-707-804-01	PZ SWITCH ASSY	
309	3-707-802-01	MOTOR ASSY, PZ GEAR		319	3-707-568-01	ADAPTOR, LENS HOOD	
310	3-707-797-01	PIN		320	1-547-380-11	LENS, ZOOM (VCL-B508XB)	301-319

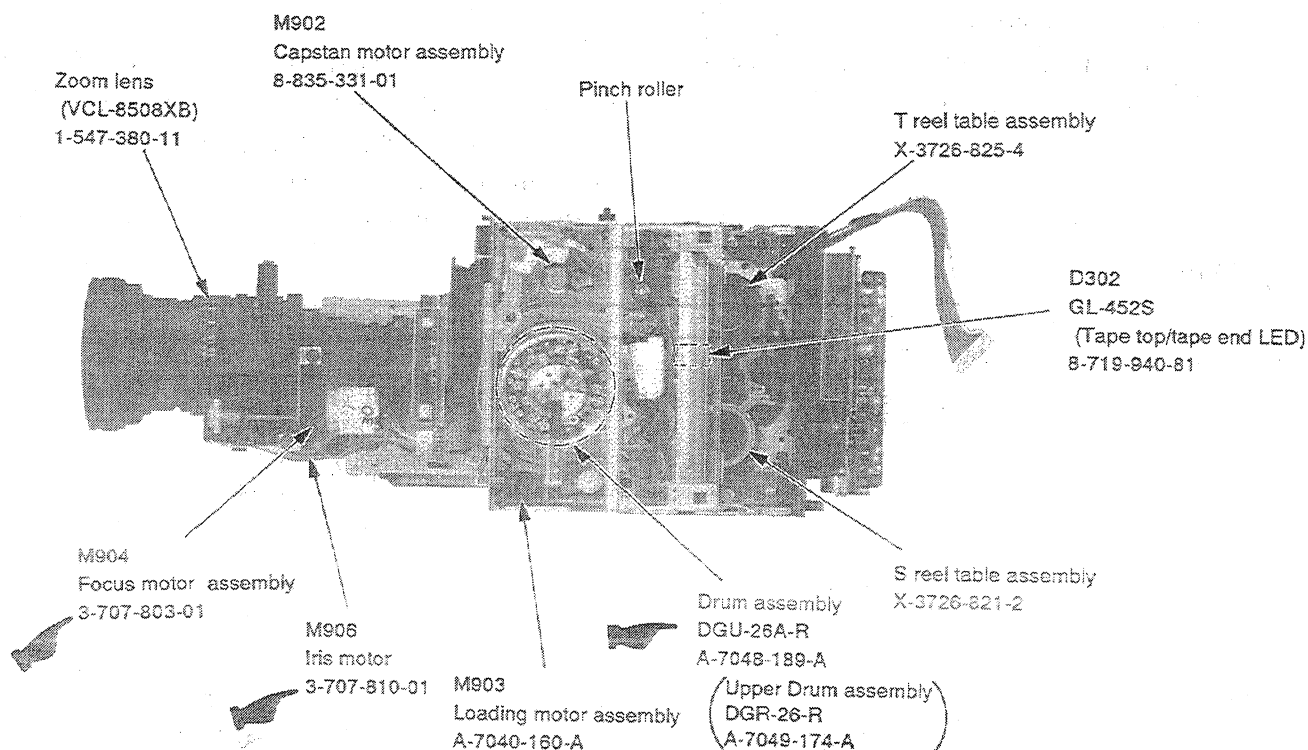
CORRECTION

 : Corrected portion

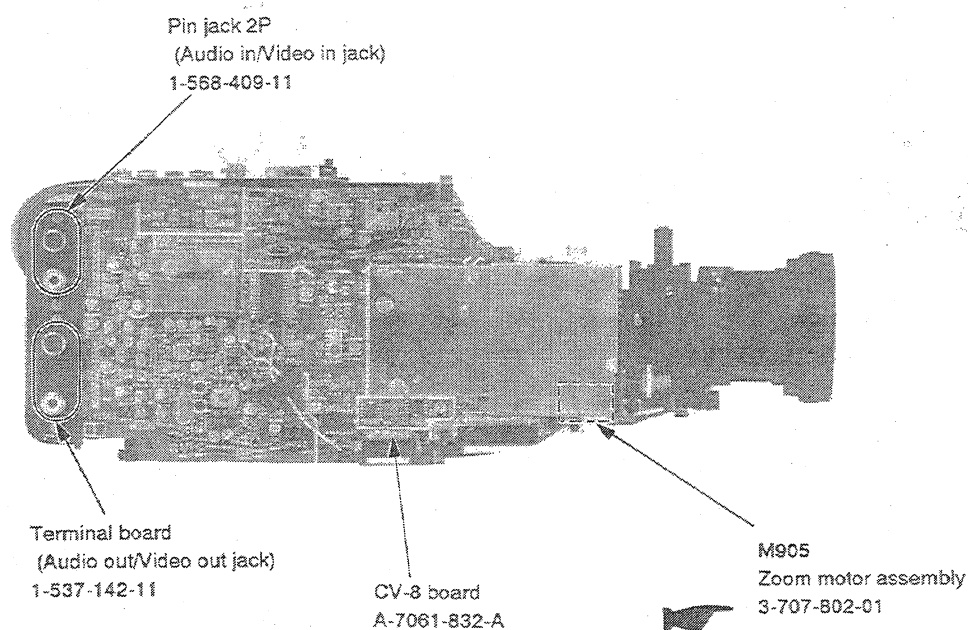
Page. 32

2-12. INTERNAL VIEW

— Right Side —



— Left Side —

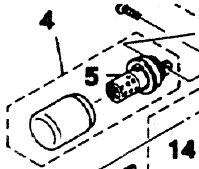
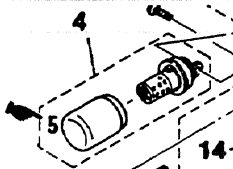
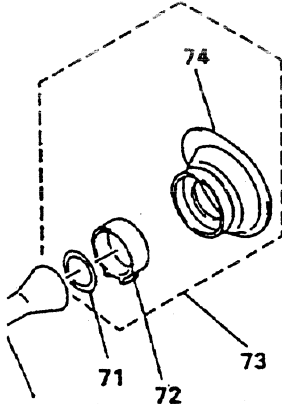
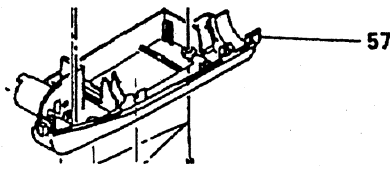
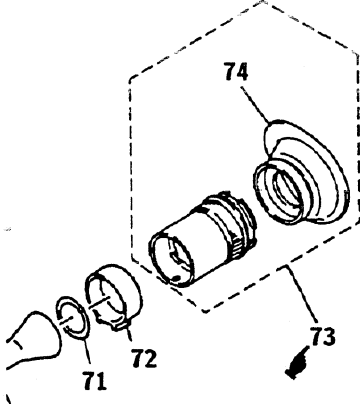
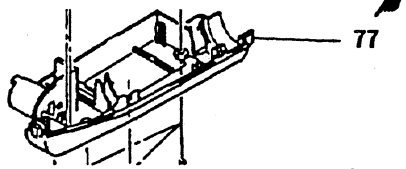


Page. 94,107,112
 CV-8 BOARD printed wiring board location B-2
 R205 deleted

Schematic Diagrams Title

Page	INCORRECT	CORRECT
135	CO-2 (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL), CC-26 (TFG/SFG AMP), KS-6 (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR),	CO-2 (HEAD AMP, AUDIO) SCHEMATIC DIAGRAMS
143	CO-2 (HEAD AMP, AUDIO/SERVO, SYSTEM CONTROL) SCHEMATIC DIAGRAMS	CO-2 (SERVO/SYSTEM CONTROL), CC-26 (TFG/SFG AMP), KS-6 (CAPSTAN MOTOR DRIVE JUNCTION), FP-89 (TAPE END SENSOR), FP-90 (TAPE TOP SENSOR) SCHEMATIC DIAGRAMS

Exploded Views

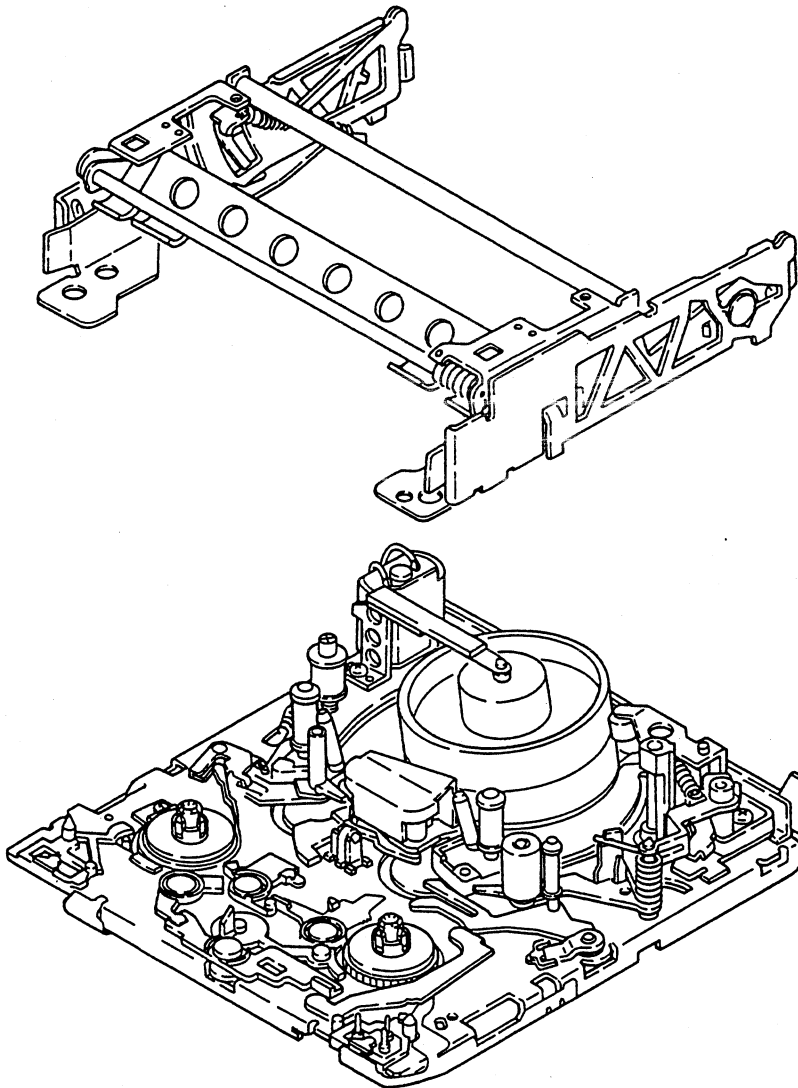
Page	INCORRECT	CORRECT																
172																		
174	 	 																
	<table><tr><th>No.</th><th>Part No.</th><th>Description</th><th>Remark</th></tr><tr><td>77</td><td>7-671-156-01</td><td>BALL,STAINLESS</td><td></td></tr></table>	No.	Part No.	Description	Remark	77	7-671-156-01	BALL,STAINLESS		<table><tr><th>No.</th><th>Part No.</th><th>Description</th><th>Remark</th></tr><tr><td>77</td><td>X-3732-911-1</td><td>CABINET (LOWER) ASSY,EVF</td><td></td></tr></table>	No.	Part No.	Description	Remark	77	X-3732-911-1	CABINET (LOWER) ASSY,EVF	
No.	Part No.	Description	Remark															
77	7-671-156-01	BALL,STAINLESS																
No.	Part No.	Description	Remark															
77	X-3732-911-1	CABINET (LOWER) ASSY,EVF																
176	<table><tr><td>157</td><td>A-7048-219-A</td><td>DRUM ASSY (DGU-41A-R)</td><td>158,159</td></tr><tr><td>159</td><td>A-7049-203-A</td><td>DRUM ASSY,UPPER (DGU-41R)</td><td></td></tr></table>	157	A-7048-219-A	DRUM ASSY (DGU-41A-R)	158,159	159	A-7049-203-A	DRUM ASSY,UPPER (DGU-41R)		<table><tr><td>157</td><td>A-7048-189-A</td><td>DRUM ASSY (DGU-26A-R)</td><td>158,159</td></tr><tr><td>159</td><td>A-7049-174-A</td><td>DRUM ASSY,UPPER, ROTARY(DGU-26-R)</td><td></td></tr></table>	157	A-7048-189-A	DRUM ASSY (DGU-26A-R)	158,159	159	A-7049-174-A	DRUM ASSY,UPPER, ROTARY(DGU-26-R)	
157	A-7048-219-A	DRUM ASSY (DGU-41A-R)	158,159															
159	A-7049-203-A	DRUM ASSY,UPPER (DGU-41R)																
157	A-7048-189-A	DRUM ASSY (DGU-26A-R)	158,159															
159	A-7049-174-A	DRUM ASSY,UPPER, ROTARY(DGU-26-R)																

8mm Video MECHANICAL ADJUSTMENT MANUAL III

U MECHANISM

Video 8

Please use in conjunction with the SERVICE MANUAL.



8 MECHANISM DECK
SONY®

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1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

- 1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
- 2) Cover the LED assembly with an opaque cap, etc. ①.
- 3) Attach a piece of tape to the RECOG switch ② so that the pin is held down.
- 4) Push the EJECT lever ③ in the direction of the arrow A.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

- 1) Follow the procedures in section 1-1-1. above.
- 2) Put the rubber band ④ around the S and T reels.
- 3) Press the PLAY switch of unit, then push the tension regulator arm assembly ⑤ in the direction of the arrow B when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
- 4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

- 1) To eject, turn the EJECT switch on.

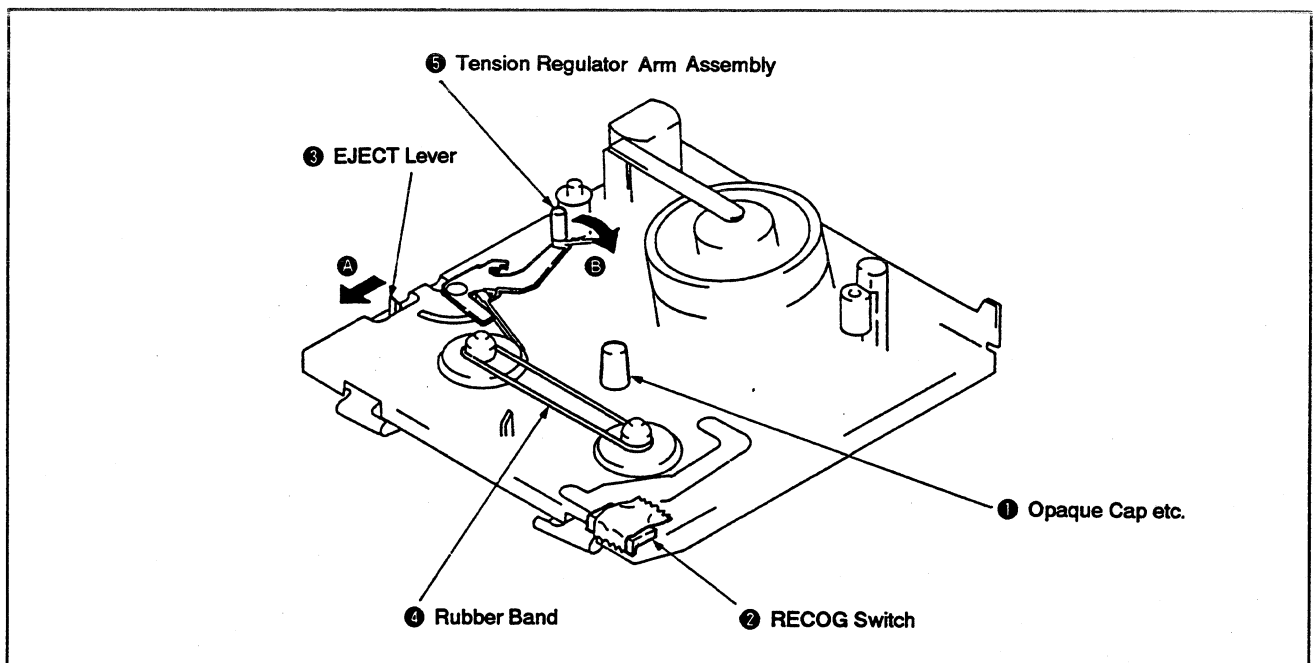


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

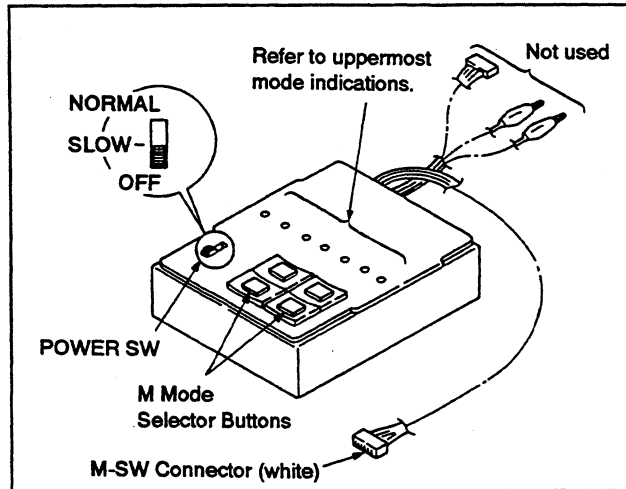


Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

- 1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ① onto the mode selector.
- 2) Attach the conversion connector (Ref. No. J-8) ③ of MODE SELECTOR III to the 6-pin connector (white) ② of the mode selector M-SW.
- 3) Remove the FP-89 flexible board ⑤ from the flexible connector ④.
- 4) Attach the FP-89 flexible board ⑤ to the flexible connector ⑥ of the MODE SELECTOR III conversion connector ③, then attach the 2-pin connector (white) ⑧ of the loading motor to the 2-pin connector (white) ⑦.

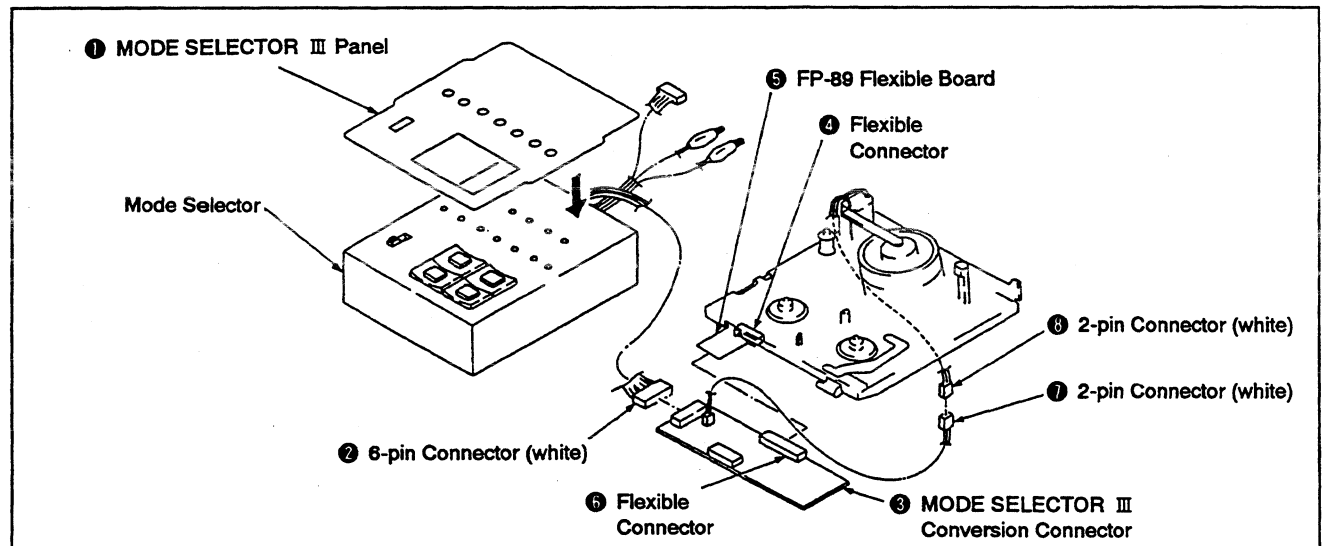


Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

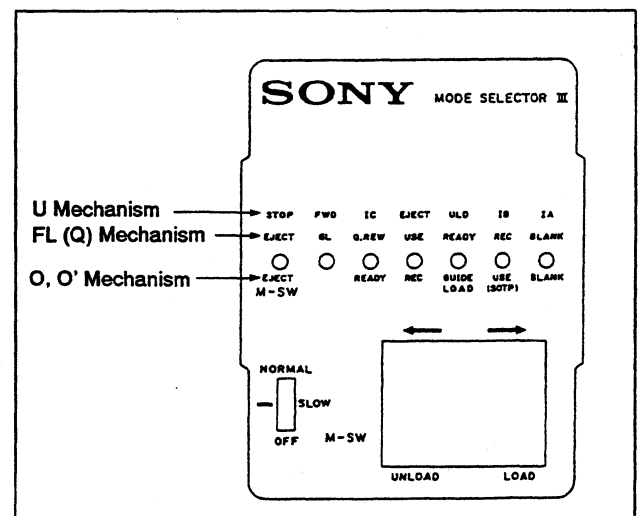


Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

- 1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.

Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

- 1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

- 1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

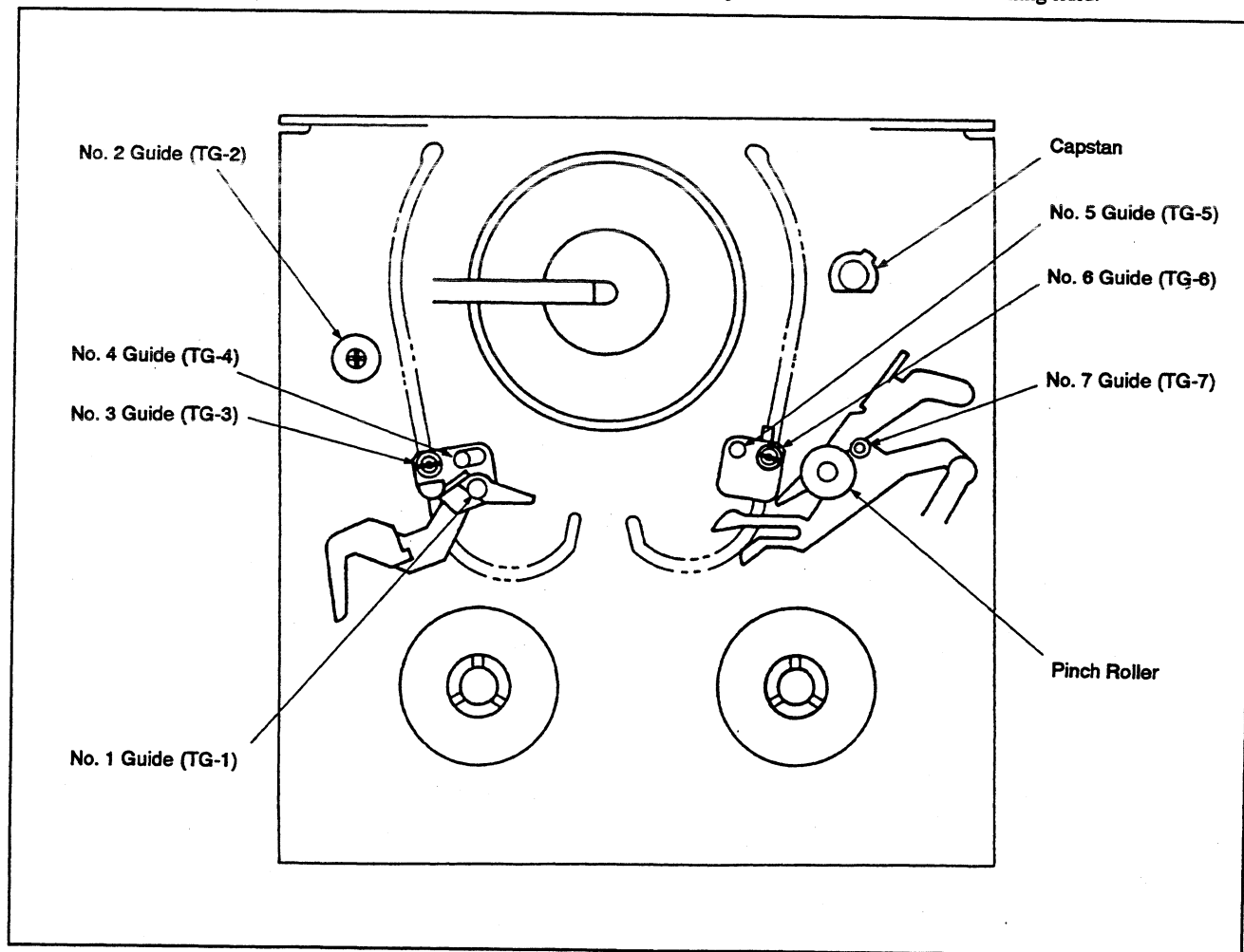


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○ Cleaning ◎ Lubrication ☆ Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demagnetizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-866-01
	Relay belt (long)	—	☆	—	☆	—	☆	—	☆	—	☆	3-728-865-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	1-541-612-11
Performance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD, RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
Specified oil: Part No. 7-661-018-01
(Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
Grease: Part No. 7-662-010-08
(Sony grease SGL-701)

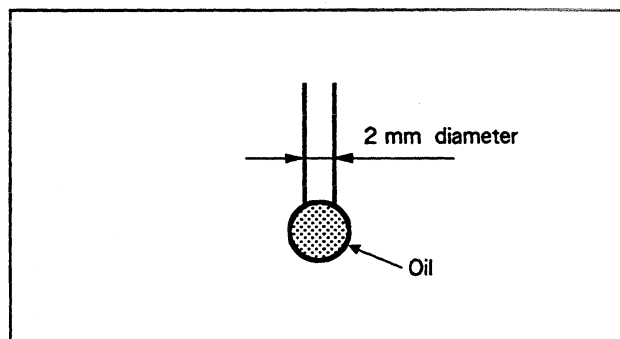
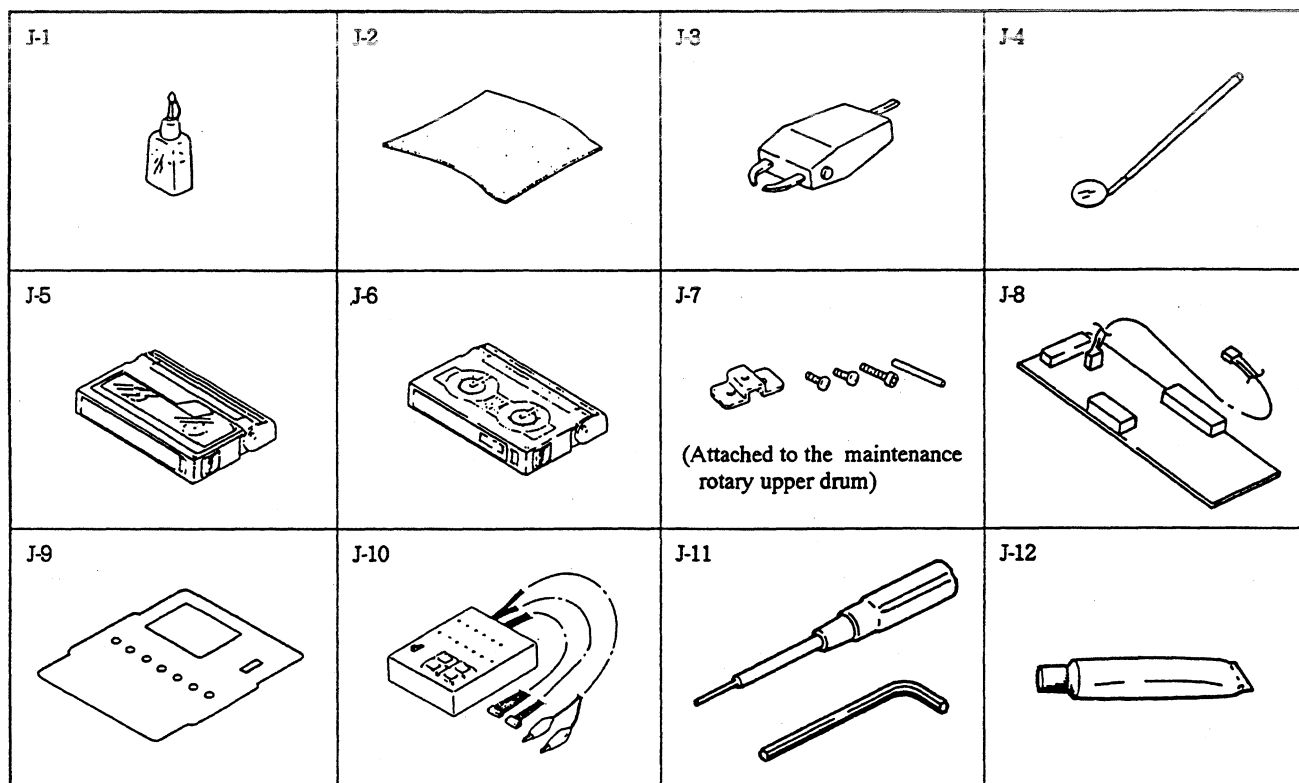


Fig. 2-2.

2-5. SERVICING TOOLS

Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	—	
J-2	Chamois cloth	2-034-697-00	—	
J-3	Head demagnetizer	Commercially available	—	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-824-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 k Ω)



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

- Notes:**
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
 - Modes within a frame are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

- 1) Remove the screw ①, then remove the HC roller assembly ②.

2. Installation (See Fig. 3-1.)

- 1) Align the two dowels ③ attached to the HC roller assembly ② with the two holes ④ in the mechanism chassis.
- 2) Secure the HC roller assembly ② with the screw ①.

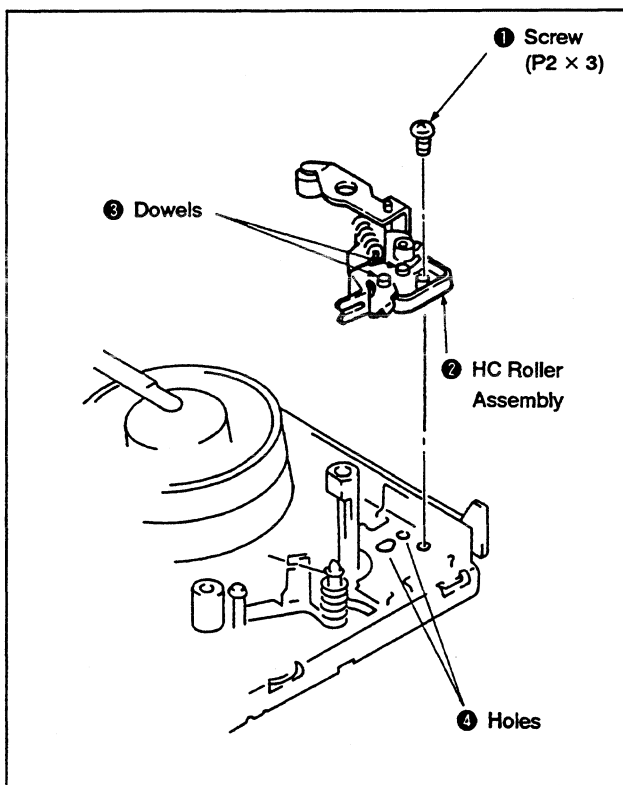


Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

- Remove the screw ①, then remove the guide guard assembly ②.

2. Installation (See Fig. 3-2.)

- 1) Align the dowel ③ attached to the guide guard assembly ② with the hole ④.
- 2) Secure the guide guard assembly ② with the screw ①.

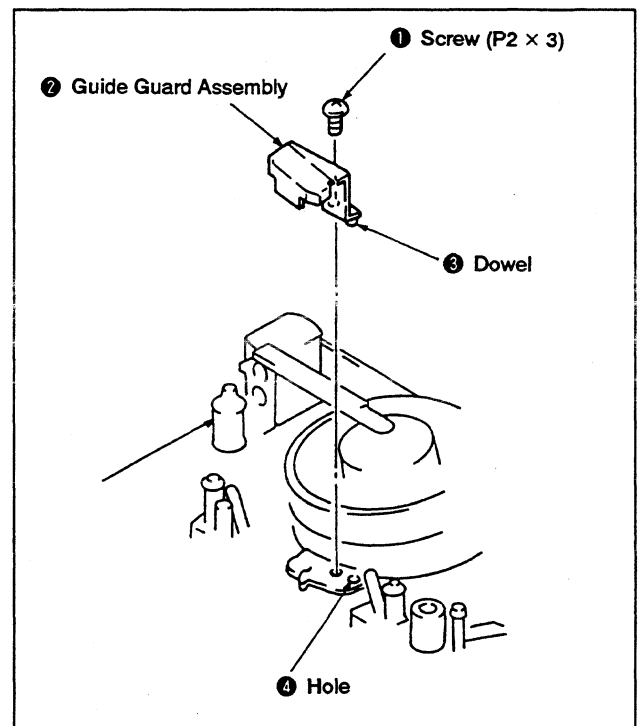


Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

- 1) Set the **ULD** mode.
- 2) Turn the stopper ❶ in the direction of the arrow A as far as it will go.
- 3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

- 1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
- 2) Secure the DC motor assembly ❸ with the two screws ❷.
- 3) Turn the stopper ❶ in the direction of the arrow B as far as it will go.

Note:

- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

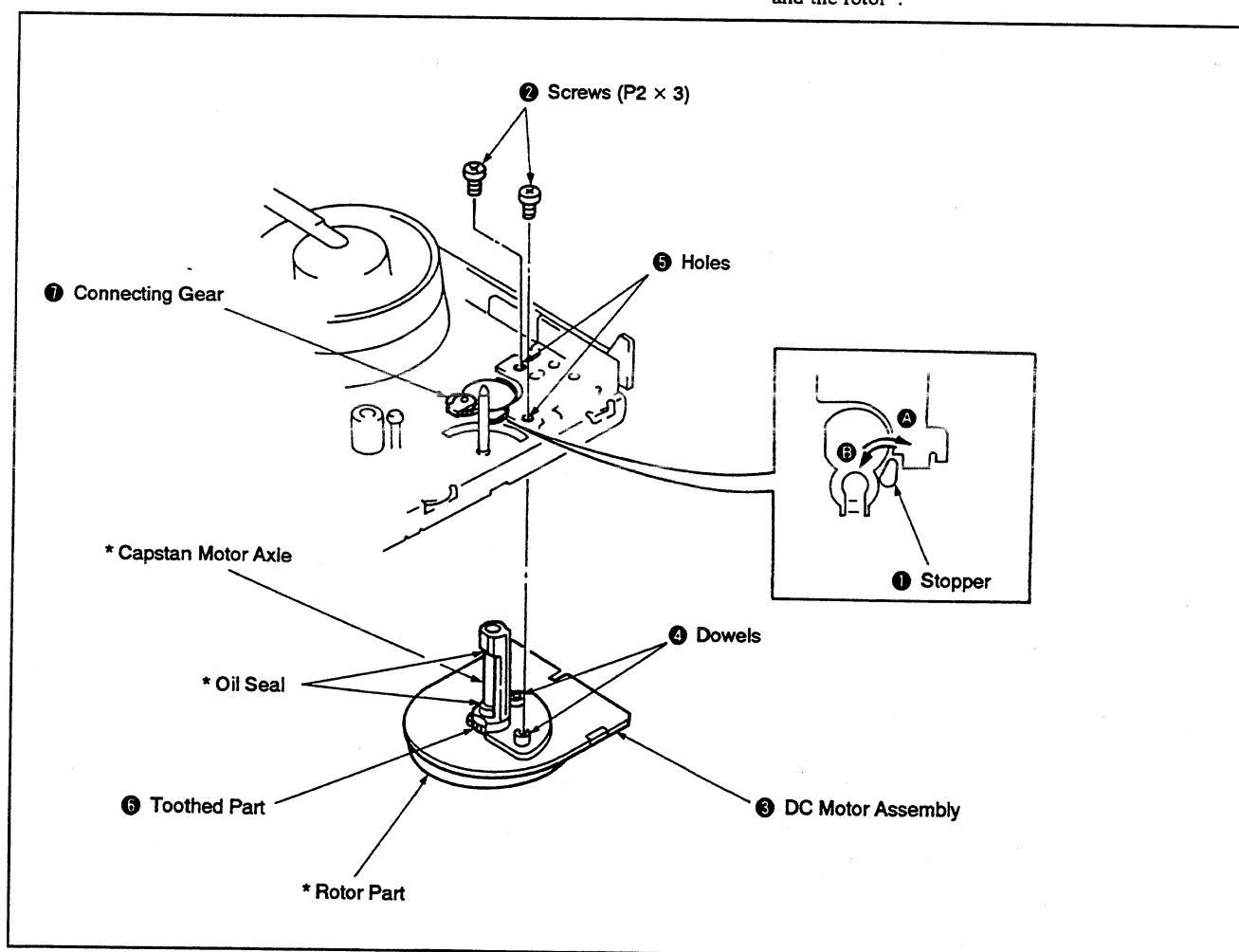


Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

- 1) Remove the torsion coil spring (ST) ①.
- 2) Remove the axle holding pin ②, then remove the T brake ③.
- 3) Remove the axle holding pin ④, then remove the S brake ⑤.

2. Installation (See Fig. 3-4.)

- 1) While fitting the toothed part ⑥ into the notch ⑦, mount the S brake ⑤.
- 2) Insert the axle holding pin ④.
- 3) Insert the axle ⑧ to the S reel side of the brake release arm ⑨ so that the A part comes closer to the drum than part B, and mount the T brake ③.
- 4) Insert the axle holding pin ②.
- 5) Insert the torsion coil spring (ST) ① below the claw ⑪ of the axle ⑩, then hook it to two claws ⑫.

Note: Confirm that the claws of axle holding pins ② and ④ are not broken before assembling.

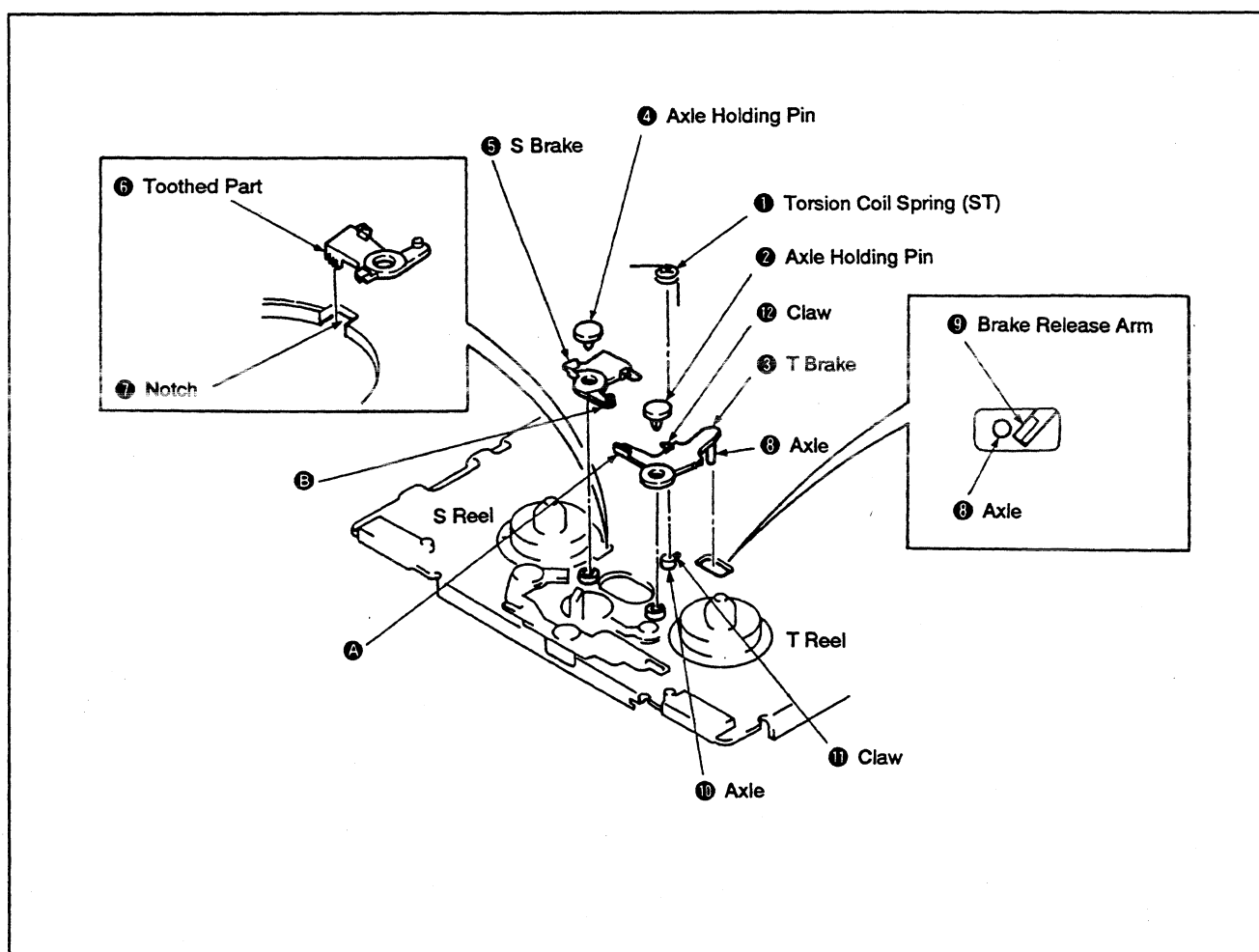


Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

1. Removal (See Fig. 3-5.)

- 1) Remove the screw ①, then remove the TL holding plate ②.
- 2) Remove the axle holding pin ③, then remove the LB brake ④.
- 3) Remove the axle holding pin ⑤, then remove the LB lever ⑥.

2. Installation (See Fig. 3-5.)

- 1) Mount the LB lever ⑥ matching it to pin ⑦ of the LB gear, then secure it with the axle holding pin ⑤.
- 2) Insert the pin ⑧ into the notch ⑨ of the LB lever ⑥, then mount the LB brake ④ while inserting the toothed part ⑩ into the notch ⑪.
- 3) Insert the axle holding pin ③.
- 4) Align the dowel ⑫ with the hole ⑬, then mount the TL holding plate and secure it with the screw ①.

Note: Confirm that the claws of axle holding pins ③ and ⑤ are not broken before assembling.

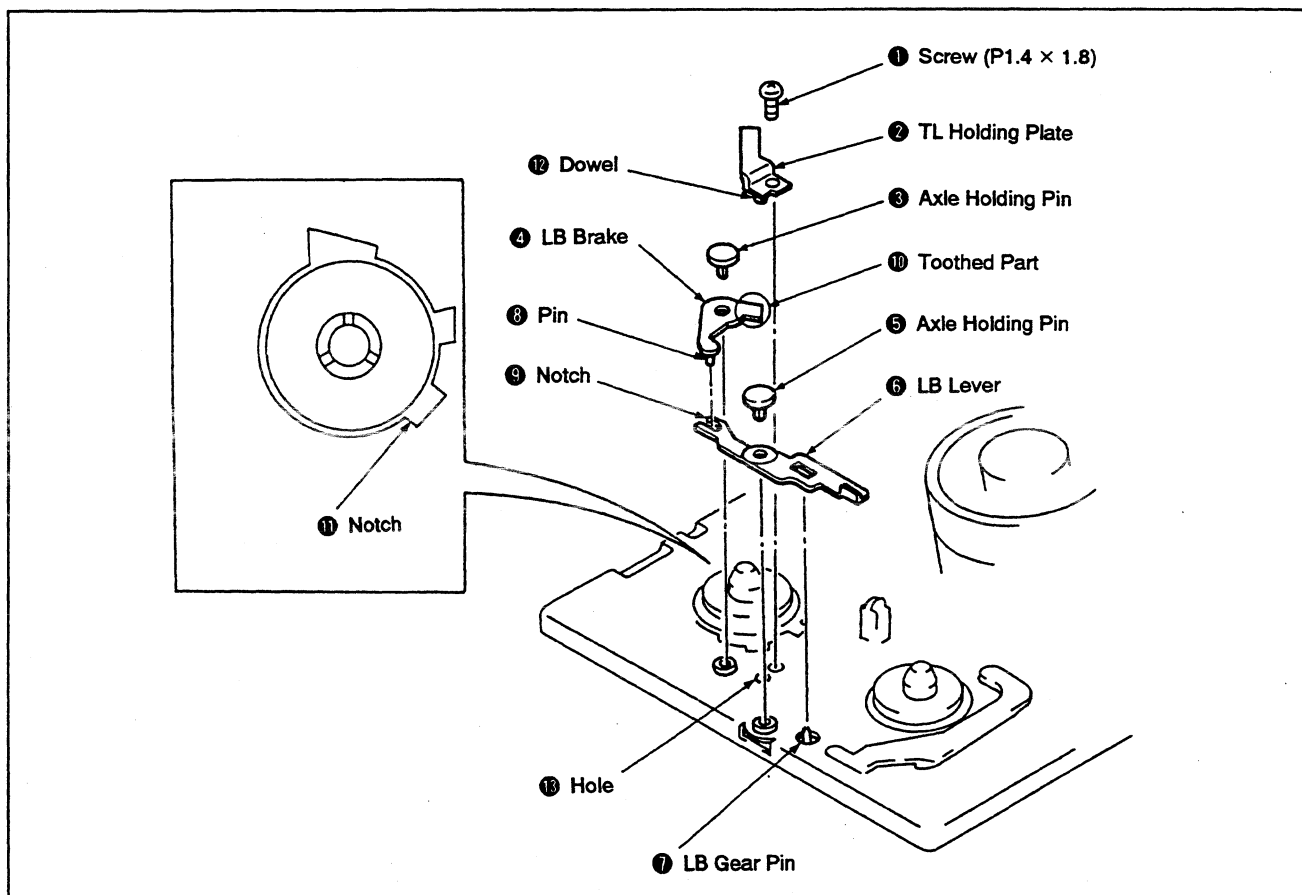


Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

- 1) While pushing the claw ① in the direction of the arrow, remove the LB release arm ②.

2. Installation (See Fig. 3-6.)

- 1) Fit the LB release arm ② to the axle ③, insert protrusions a, b, c, d into the three holes ④, then secure with the claw ①.

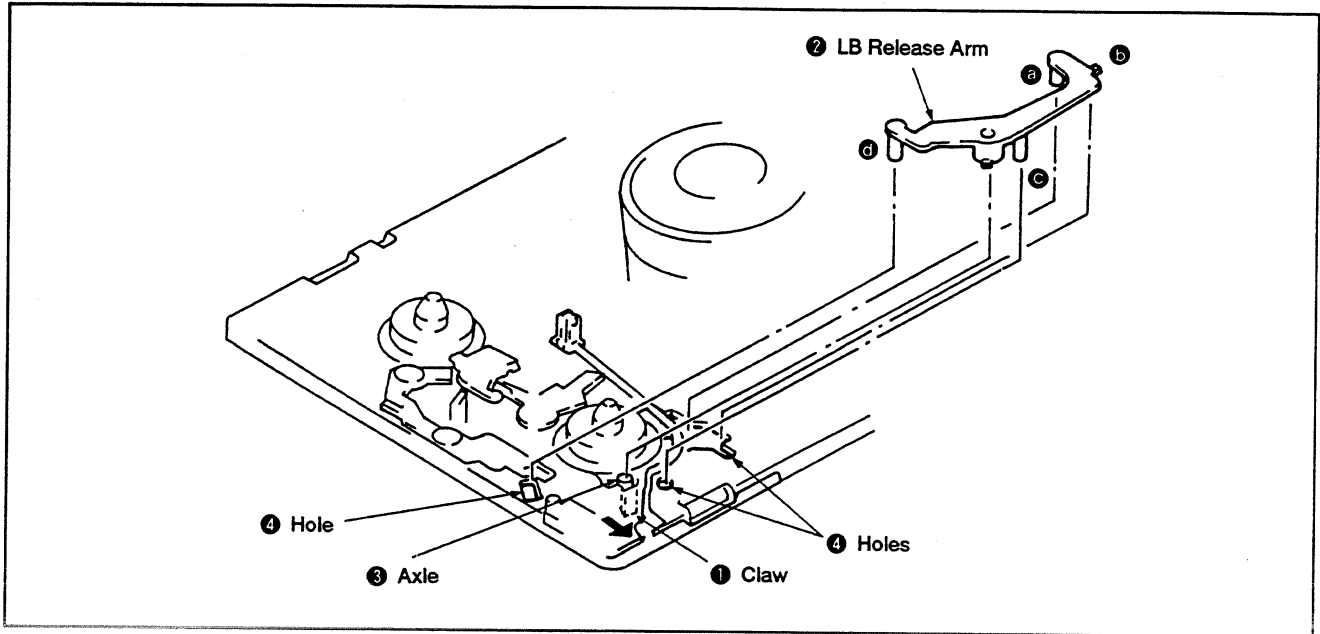


Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig. 3-7.)

- 1) Remove the torsion coil spring (RK) ①.
- 2) Open the chassis claw ②, then remove the RK stopper arm ③.
- 3) Remove the RK stopper ④.

2. Installation (See Fig. 3-7.)

- 1) Mount the RK stopper ④ onto the axle ⑤.
- 2) Mount the RK stopper arm ③ onto the axle ⑥, insert Pin ⑩ into hole ⑪, then hook the claw ② of the chassis to the hole ⑦.
- 3) Insert the torsion coil spring (RK) ① into the axle ⑤, then hook it to claws ⑧ and ⑨.

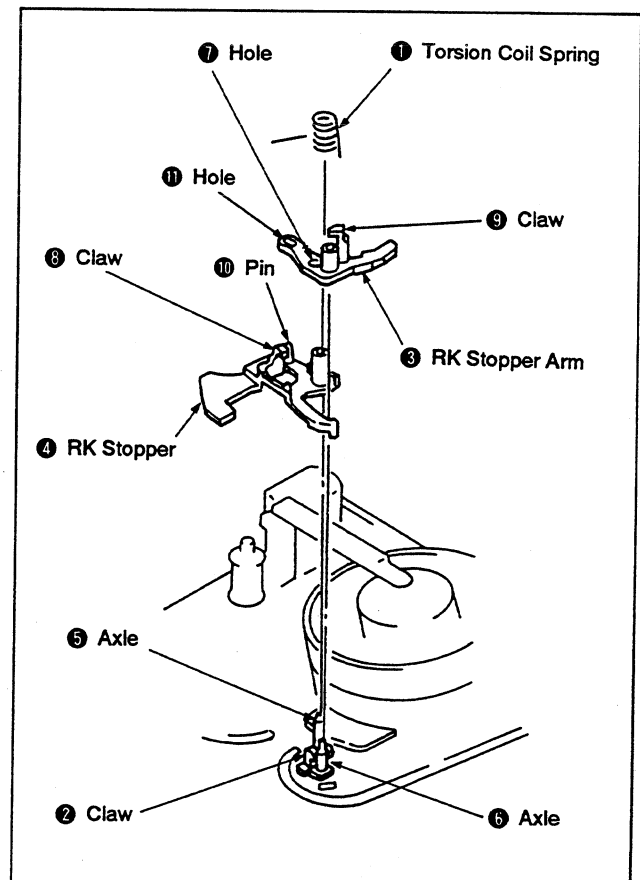


Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

- 1) Set the **[B]** mode.
- 2) Remove the stopper washer ①, then remove the pinch arm assembly ②.
- 3) Bend the claw ④ inside hole ③ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ⑤.
- 4) Remove the TG-7 arm assembly ⑥.

2. Installation (See Fig. 3-8.)

- 1) Grease the inner surfaces of hole ⑦ (See Fig. A).
- 2) Insert the axle ⑧ of the TG-7 arm assembly ⑥ into the hole ⑦.
- 3) Grease the shaded section ④ (See Fig. A).
- 4) Insert the TG-7 plate spring ⑤ into the hole ③, then secure it with the claw ④.
- 5) Apply half a drop of oil to the axle ⑨ (See Fig. B).
- 6) Fit the pinch arm assembly ② to the axle ⑨ and insert the pinch roller sub arm assembly tab ⑩ into the ⑥ part.
- 7) Install the stopper washer ①.

Note:

- Take care not to grease the screw ⑪ of the TG-7 arm assembly ⑥ (See Fig. A).
- When fitting the pinch arm assembly ② to the axle ⑨, make sure that it does not touch the TG-7 guide ⑫ or the rubber roller ⑬.
- After assembling, be sure to perform tape path adjustment as described in section 4.

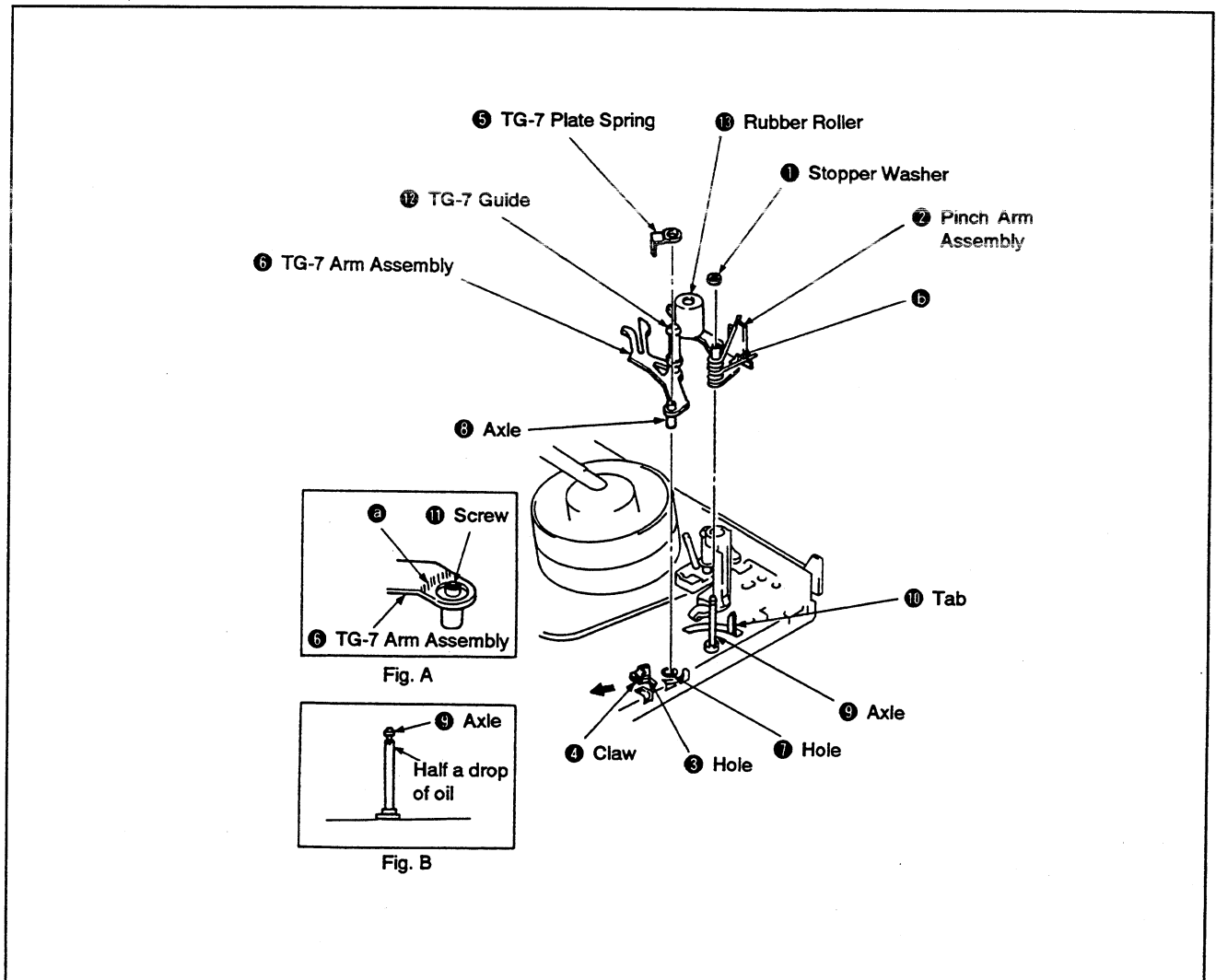


Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

- 1) Remove the TG-2 upper flange assembly ①.
- 2) Remove the TG-2 roller ②, the TG-2 sleeve ③, the TG-2 lower flange ④ and the compression spring ⑤.

2. Installation (See Fig. 3-9.)

- 1) Mount the compression spring ⑤, the TG-2 lower flange ④, the TG-2 sleeve ③ and the TG-2 roller ② to the axle.
- 2) Secure the TG-2 upper flange ① to the axle by rotating it 4 to 6 turns.

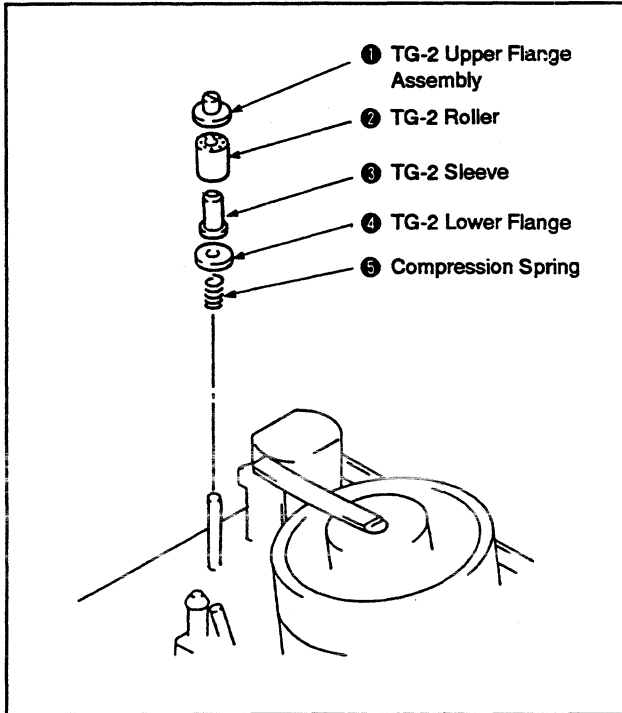


Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

- 1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ① upper surface to 18.6 mm by turning the TG-2 upper flange ①.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

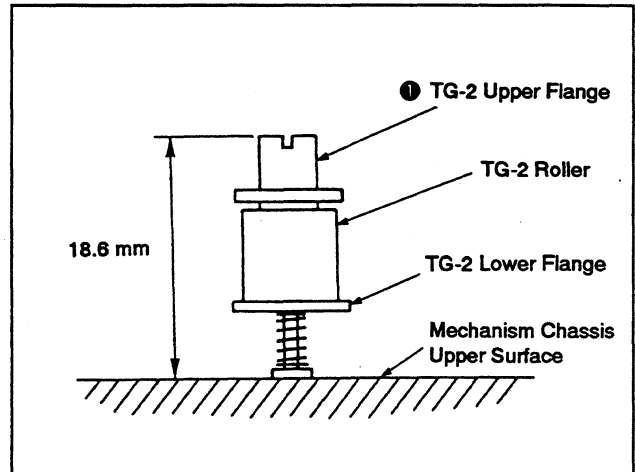


Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

- 1) Remove the S brake and T brake as described in section 3-4.
- 2) Remove the TL holding plate as described in section 3-5.
- 3) Remove the tension regulator band assembly as described in section 3-11.
- 4) Remove the S reel table assembly ①.
- 5) Turn the stopper ② approx. 90° in the direction of the arrow A.
- 6) While sliding the LB release arm ③ in the direction of the arrow B, remove the T reel table assembly ④.

2. Installation (See Fig. 3-11.)

- 1) Apply half a drop of oil to the axle ⑤ (See Fig. A).
- 2) Move the RK gear ⑥ in the direction of the arrow C and the TS brake ⑦ in the direction of the arrow D, putting them out of the way.

- 3) While sliding the LB release arm ③ in the direction of the arrow B, mount the T reel table assembly ④ onto the axle ⑤, then turn the stopper ② in the direction of the arrow E as far as it will go.
- 4) Apply half a drop of oil to the axle ⑧ (See Fig. B).
- 5) Move the RK gear ⑥ in the direction of the arrow F, the UL brake ⑨ in the direction of the arrow G and the LB brake ⑩ in the direction of the arrow H, putting them out of the way.
- 6) Mount the S reel table ① onto the axle ⑧.
- 7) Mount the tension regulator band assembly as described in section 3-11.
- 8) Mount the TL holding plate as described in section 3-5.
- 9) Mount the S brake and T brake assemblies as described in section 3-4.

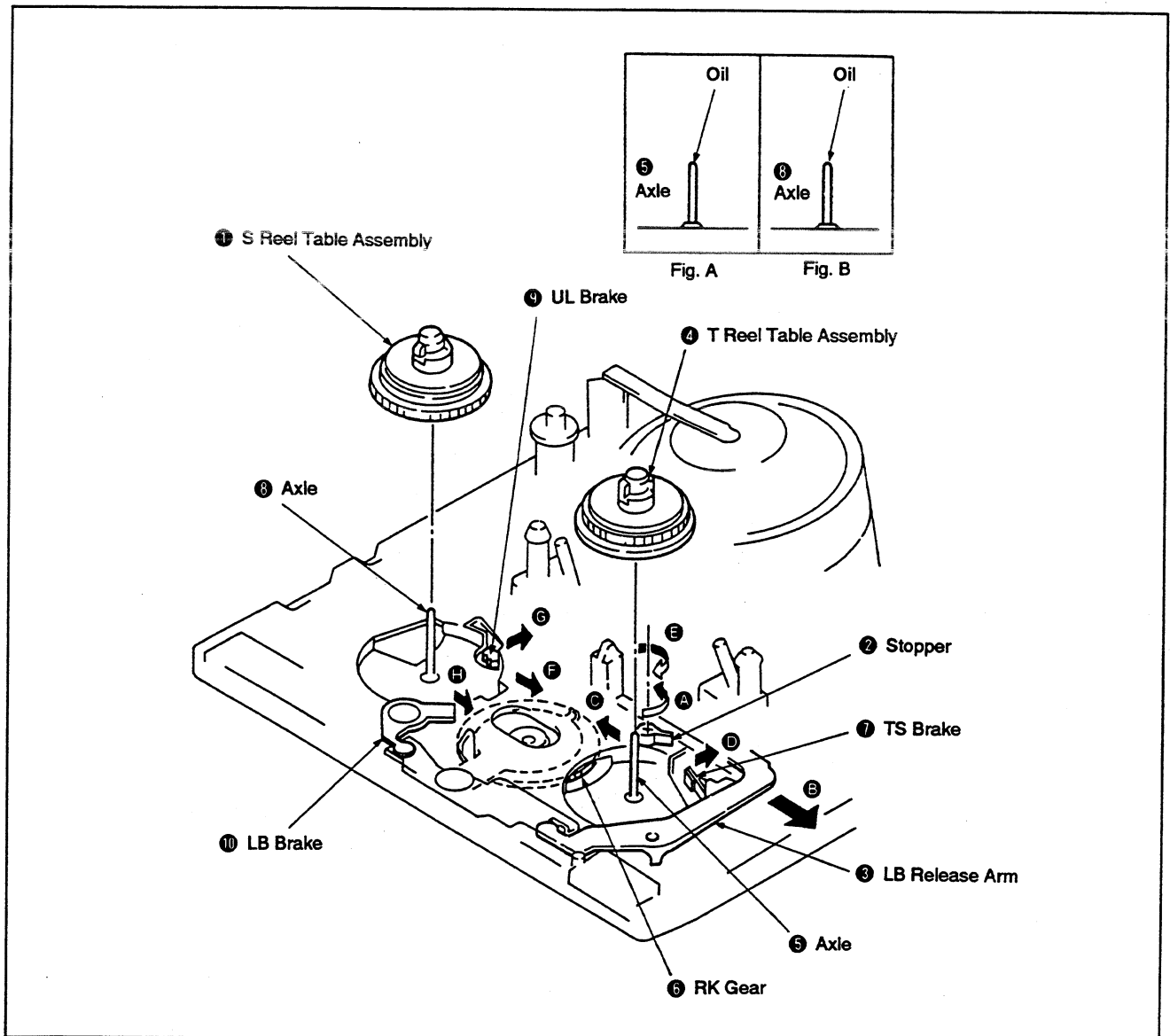


Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

- 1) Remove the TL holding plate as described in section 3-5.
- 2) Remove the screw ①.
- 3) Using a thin screwdriver or the like, remove the tension regulator band assembly ④ from the axle ③ of tension regulator arm assembly ②.
- 4) Remove the tension spring ⑤.
- 5) Remove the stopper washer ⑥ from the back of the mechanism chassis, then remove the tension regulator arm assembly ②.
- 6) Open the claw ⑦, then remove the adjust arm ⑧.

Note: When removing the tension regulator band assembly ④, take care not to twist or bend it, and not to touch the felt surface ⑨.

2. Installation (See Fig. 3-12.)

- 1) Engage the adjust arm ⑧ in the position shown in Fig. A, then close the claw ⑦.
- 2) Apply half a drop of oil to the hole ⑩.
- 3) Mount the tension regulator arm assembly ②, then insert it into the slot ⑪ so that the ④ part comes to the arrow A side of the switch lever assembly (See Fig. B).

- 4) While holding the tension regulator arm assembly ② from the mechanism chassis front, secure it with the stopper washer ⑥ from the back.
- 5) Hook the R hook of the tension spring ⑤ to the adjust arm ⑧ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ②.
- 6) Mount the tension regulator band assembly ④ onto the axle ③ of tension regulator arm assembly ②, and place it so that the felt surface ⑨ comes against the shaded portion of the S reel table assembly ⑫.
- 7) Mount the tension regulator plate ⑬ of the tension regulator band assembly ④ so that it is aligned with the dowel ⑭ of the mechanism chassis, then secure it temporarily with the screw ①.
- 8) Mount the TL holding plate as described in section 3-5.
- 9) Adjust tension regulator FWD position as described in section 3-12.
- 10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ②, take care not to twist or bend it, and not to touch the felt surface ⑨.

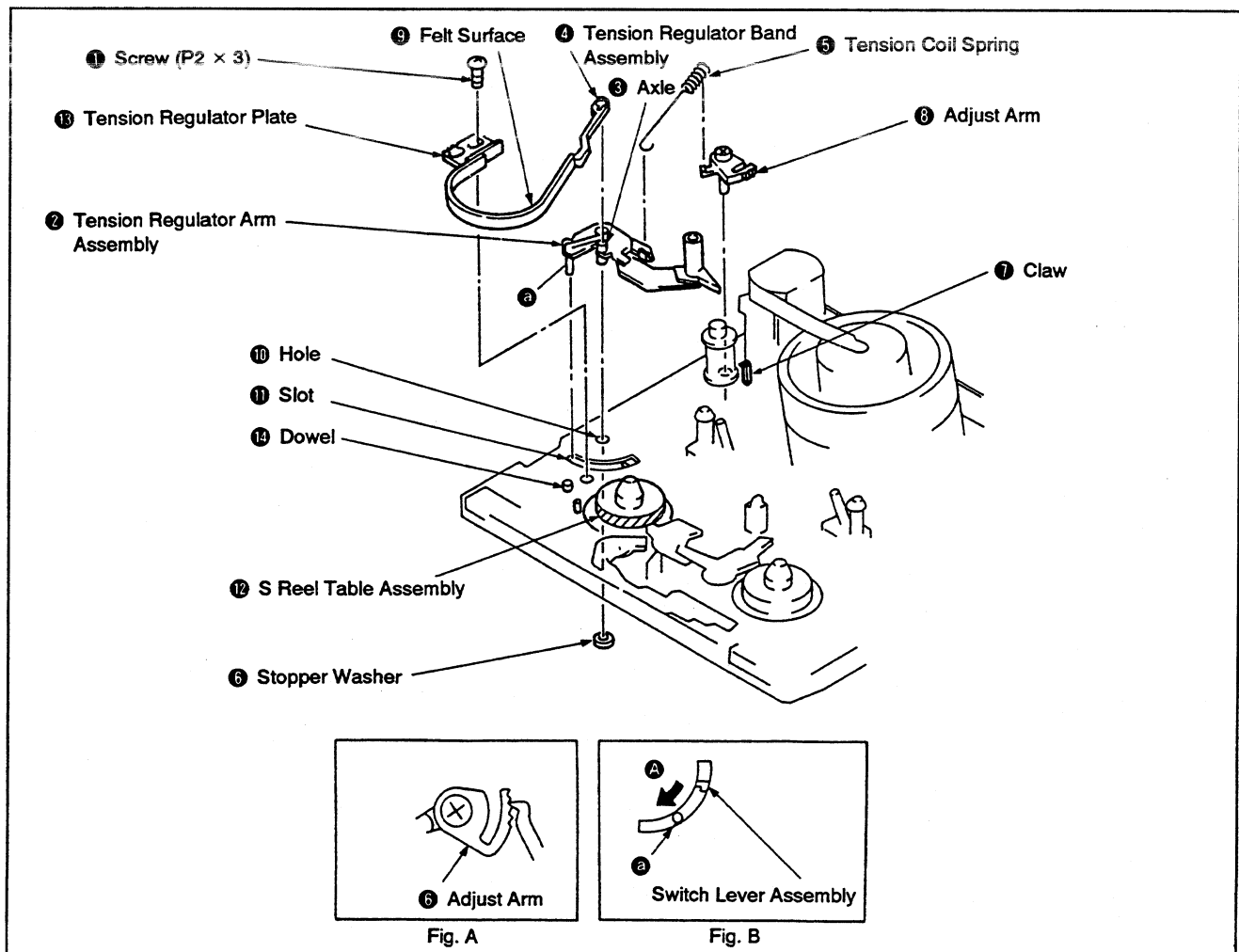


Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

- 1) Load a cassette tape and set the **FWD** mode.
- 2) Confirm whether the distance between ❶ part of the tension regulator arm and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
- 3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
- 4) Slide the tension regulator plate ❺ in the direction of the arrow **A** if the measured distance is over the specified range, and in the direction of the arrow **B** if it is under that range. Then, fix it with the screw ❹.
- 5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

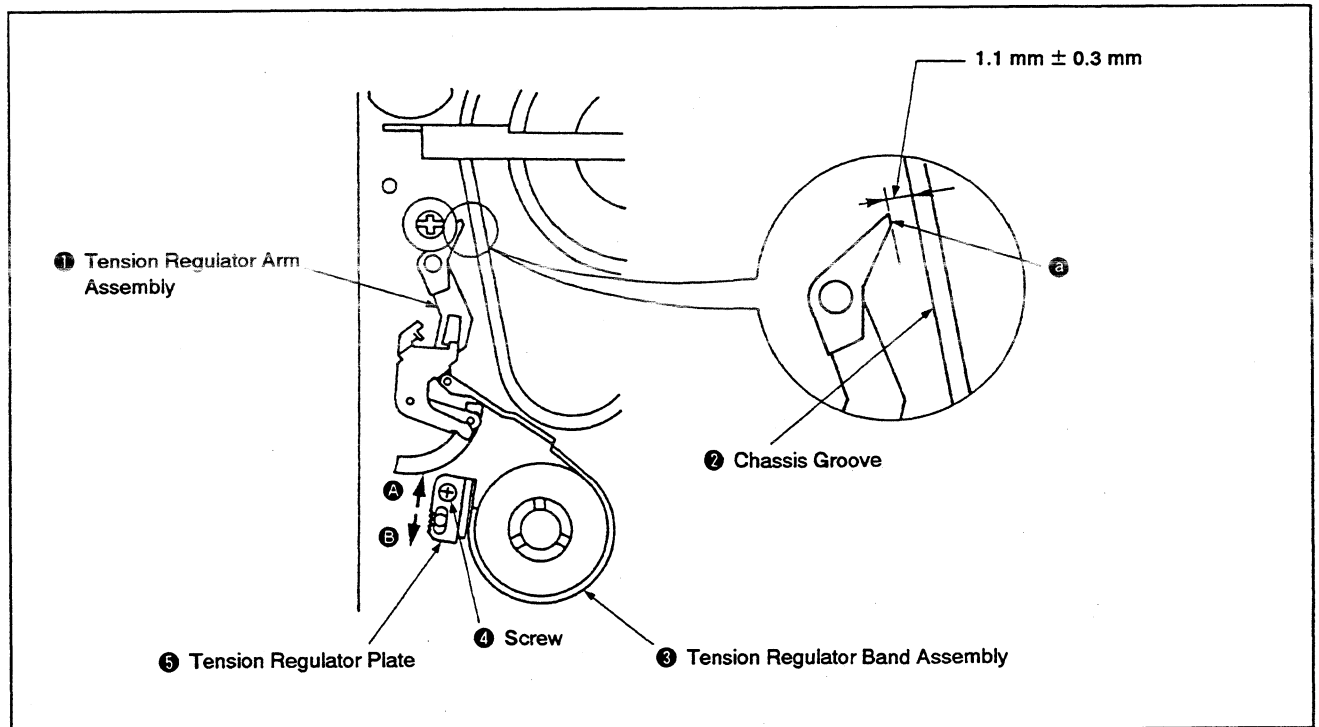


Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

- 1) Set the **EJECT** mode.
- 2) Remove the flexible board ① and the two connectors ②.
- 3) Remove the guide guard assembly as described in section 3-2.
- 4) Remove the screw ③, then remove the axle ground terminal ④.
- 5) Remove the three screws ⑤, then remove the drum assembly ⑥ from the mechanism chassis.
- 6) Remove the connector ⑩.
- 7) Remove the screw ⑦, then remove the dew sensor ⑧.

Note:

- When removing the drum assembly ⑥ from the mechanism chassis, take care not to cut the flexible board ① or the harness.
- Take care not to touch the head tip ⑨.

2. Installation (See Fig. 3-14.)

- 1) Insert part A of the dew sensor ⑧ into the notch ⑪ of the mechanism chassis, then secure it with the screw ⑦.
- 2) Mount the connector ⑩.
- 3) Clamp the harness ⑮ of the dew sensor ⑧ with the reinforcing the claw ⑯ of the plate SS assembly (See Fig. A).
- 4) Insert the connector ② and the flexible board ① into the hole ⑫ of the mechanism chassis, align the drum assembly ⑥ with the two dowels ⑬ and secure it with the three screws ⑤.
- 5) Align the axle ground terminal ④ with the two dowels ⑭ of the mechanism chassis and secure it with the screw ③.
- 6) Mount the guide guard assembly as described in section 3-2.
- 7) Mount the two connectors ② and the flexible board ①.

Note:

- Take care not to cut the flexible board ① or the harness ⑮.
- Take care not to touch the head tip ⑨.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

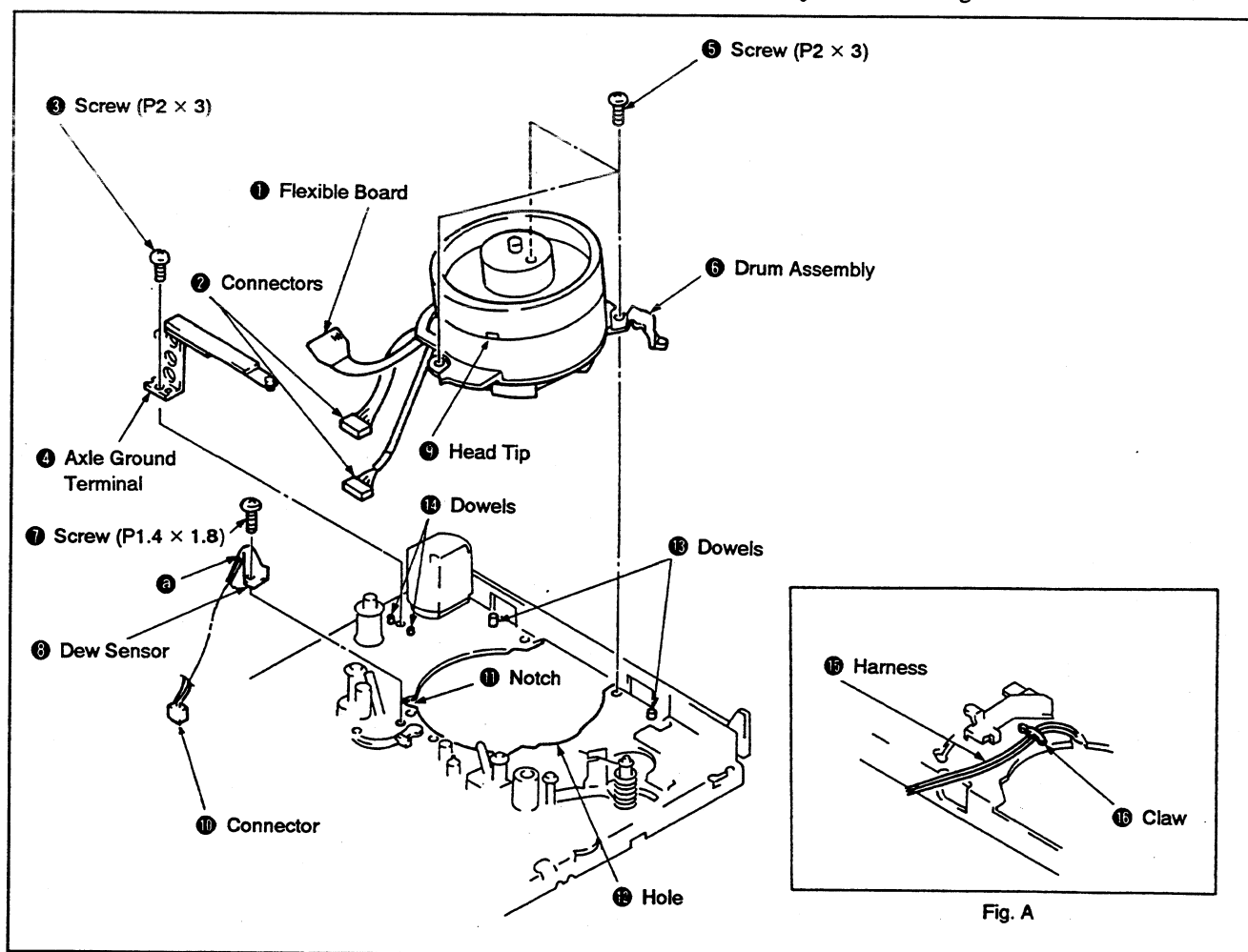


Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Set the **STOP** mode.
- 3) Remove the claw ①, then remove the eject lever ②.
- 4) Remove the stopper washer ③, then remove the switch lever assembly ④.
- 5) Remove the pinch roller load spring ⑤.
- 6) Remove the stopper washer ⑥, then remove the pinch roller sub arm assembly ⑦.

2. Installation (See Fig. 3-15.)

- 1) Grease the axle ⑧ (See Fig. A).
- 2) Assemble by inserting ② part of the pinch roller sub arm assembly ⑦ into the slot ⑨, then insert the pin ⑩ into the loading lever assembly notch ⑪.
- 3) Secure with the stopper washer ⑥.

- 4) Mount the pinch roller load spring ⑤ by catching its ⑥ end between the claw ⑫ and the chassis side and its ⑦ end to the claw ⑫.
- 5) Apply half a drop of oil to the axle ⑬ (See Fig. B).
- 6) Align the groove ⑭ of the switch lever assembly ④ with the mode detector switch protrusion ⑮, mount it on the axle ⑬, then insert the pin ⑯ into the drive gear (left) assembly ⑰ outer groove.
- 7) Secure with the stopper washer ③.
- 8) Mount the eject lever ② and close the claw ①.
- 9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ④ onto the axle ⑬ with the tension regulator arm assembly installed, set the pin ⑯ to the arrow ① side of the switch lever assembly ④.

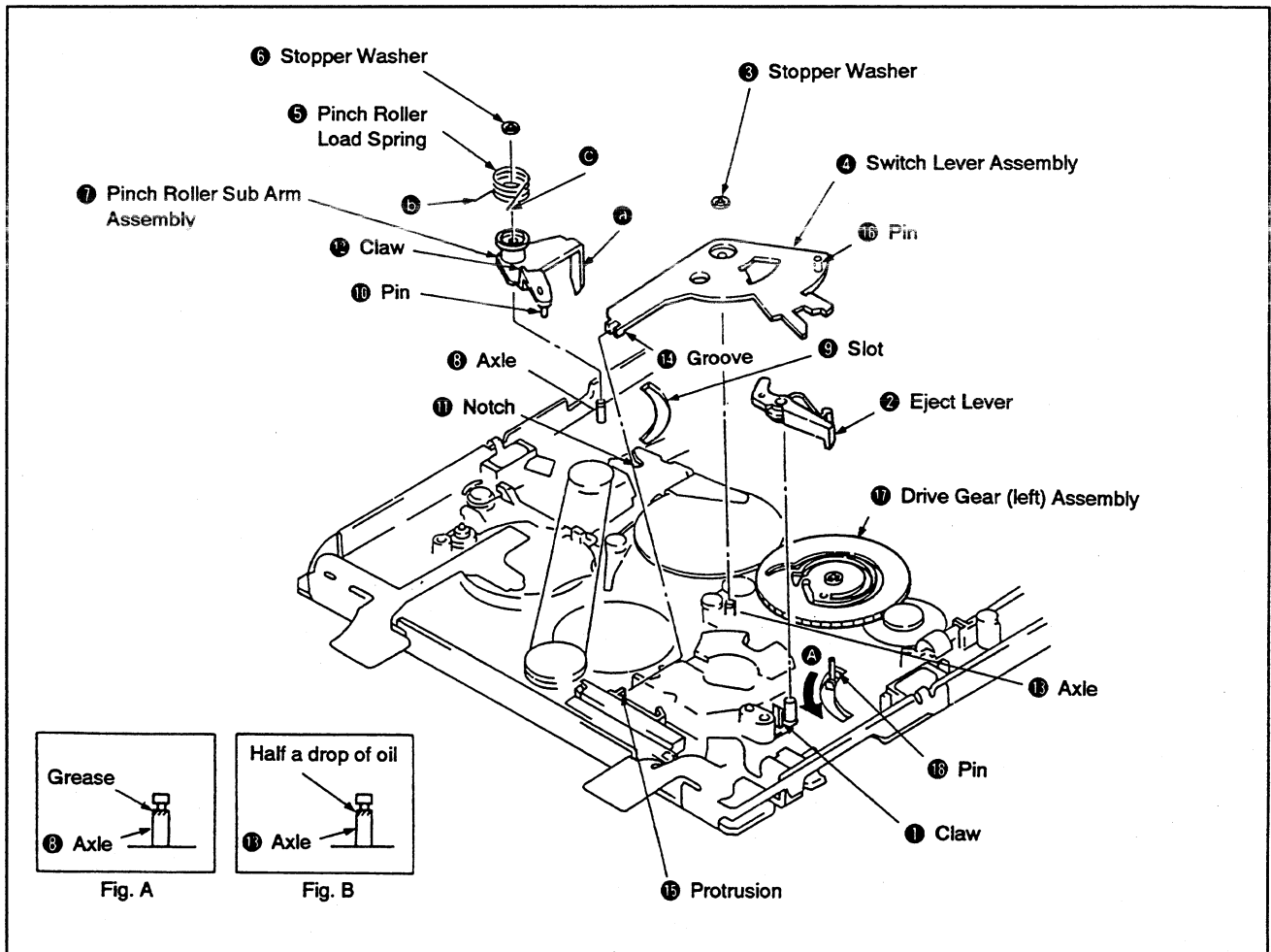


Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the pinch roller sub arm assembly as described in section 3-14.
- 3) Set the **STOP** mode.
- 4) Remove the stopper washer ①, then remove the RC gear assembly ② from the axle ④ with the timing belt (L) ③ attached.
- 5) Remove the timing belt (L) ③ from the idler pulley assembly ⑤.
- 6) Remove the stopper washer ⑥ and remove the loading lever assembly ⑧ while pushing the claw ⑦ in the direction of the arrow ④.
- 7) Turn the stopper ⑨ approx. 90° in the direction of the arrow ⑤.
- 8) Remove the connecting gear assembly ⑪ from the axle ⑩ with the timing belt (S) ⑩ attached.
- 9) Remove the timing belt (S) ⑩ from the idler pulley assembly ⑤.

Note: When removing the connecting gear ⑪, take care not touch the flange section ⑬.

2. Installation (See Fig. 3-16.)

- 1) Apply half a drop of oil to the axle ⑩ (See Fig. F).
- 2) Hook one end of the timing belt (S) ⑩ onto the connecting gear assembly ⑪ and the other end onto gear ④ of the idler pulley assembly ⑤. (Refer to the figure.)
- 3) Mount the connecting gear assembly ⑪ with the timing belt (S) ⑩ attached to the axle ⑩.
- 4) Turn the stopper ⑨ in the direction of the arrow ⑥ as far as it will go.
- 5) Apply half a drop of oil to the axle ⑫ (See Fig. A).
- 6) Fit the loading lever assembly ⑧ to the axle ⑫, secure the ② part with the claw ⑦ and place the pin ⑬ into the groove of the drive gear (right) assembly ⑭.
- 7) Install the stopper washer ⑥.
- 8) Place the timing belt (L) ③ around the gears of the RC gear assembly ② indicated in Fig. B, and its opposite side around the gear ④ of the idler pulley assembly ⑤. (See Fig. E.)
- 9) Mount the RC gear assembly ② onto the axle ④ with the timing belt (L) ③ attached, and engage it with the gear of the RK gear assembly ⑮.
- 10) Install the stopper washer ①.
- 11) Grease parts of the loading lever assembly ⑧ indicated in Fig. C.
- 12) Mount the pinch roller sub arm assembly as described in section 3-14.
- 13) Mount the DC motor (capstan motor) as described in section 3-3.

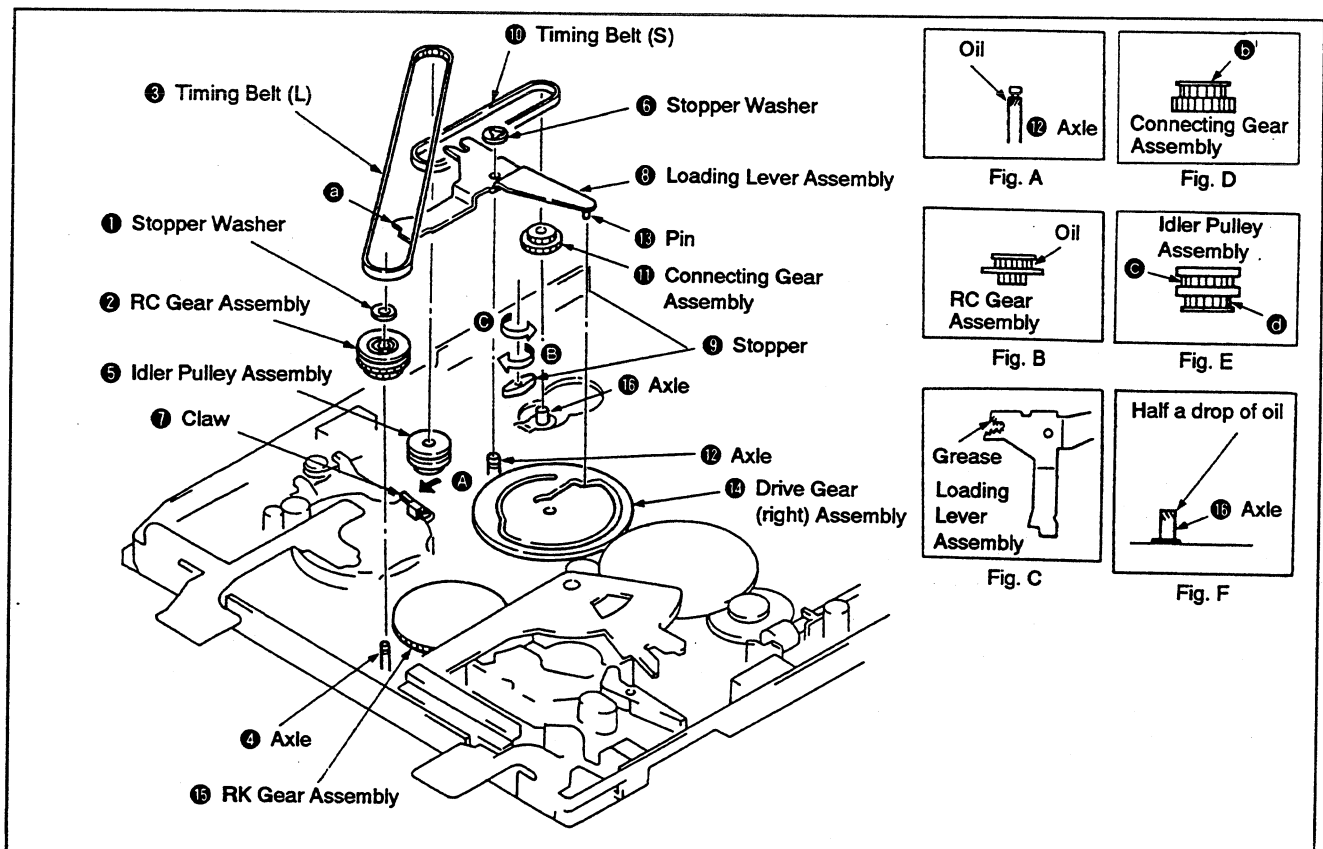


Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the switch lever assembly as described in section 3-14.
- 3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
- 4) Set the **STOP** mode.
- 5) Remove the stopper washer ①, then remove the idler pulley ②.
- 6) Open the claw ③, then remove the TS brake assembly ④.
- 7) Remove the torsion coil spring (LB) ⑤.
- 8) Remove the stopper washer ⑥, then remove the LB gear assembly ⑦.
- 9) Remove the RK gear assembly ⑧.

Note: When removing the idler pulley ②, take care not to touch the flange section ②. (See Fig. C.)

2. Installation (See Fig. 3-17.)

- 1) Apply half a drop of oil to the axle ⑨ (See Fig. A).
- 2) Mount the RK gear assembly ⑧ onto the axle ⑨, keeping it in horizontal position.
- 3) Apply half a drop of oil to the axle ⑩ (See Fig. B).
- 4) Mount the LB gear assembly ⑦ onto the axle ⑩ and secure it with the stopper washer ⑥.
- 5) Insert the torsion coil spring (LB) ⑤ into the axle ⑪, then hook it to the mechanism chassis notch ⑫ and to the tab ⑬.
- 6) Mount the TS brake assembly ④ and close the claw ③.
- 7) Apply half a drop of oil to the axle ⑭ (See Fig. D).
- 8) Mount the idler pulley ② onto the axle ⑭, then secure it with the stopper washer ①.
- 9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
- 10) Mount the switch lever assembly as described in section 3-14.
- 11) Mount the DC motor (capstan motor) as described in section 3-3.

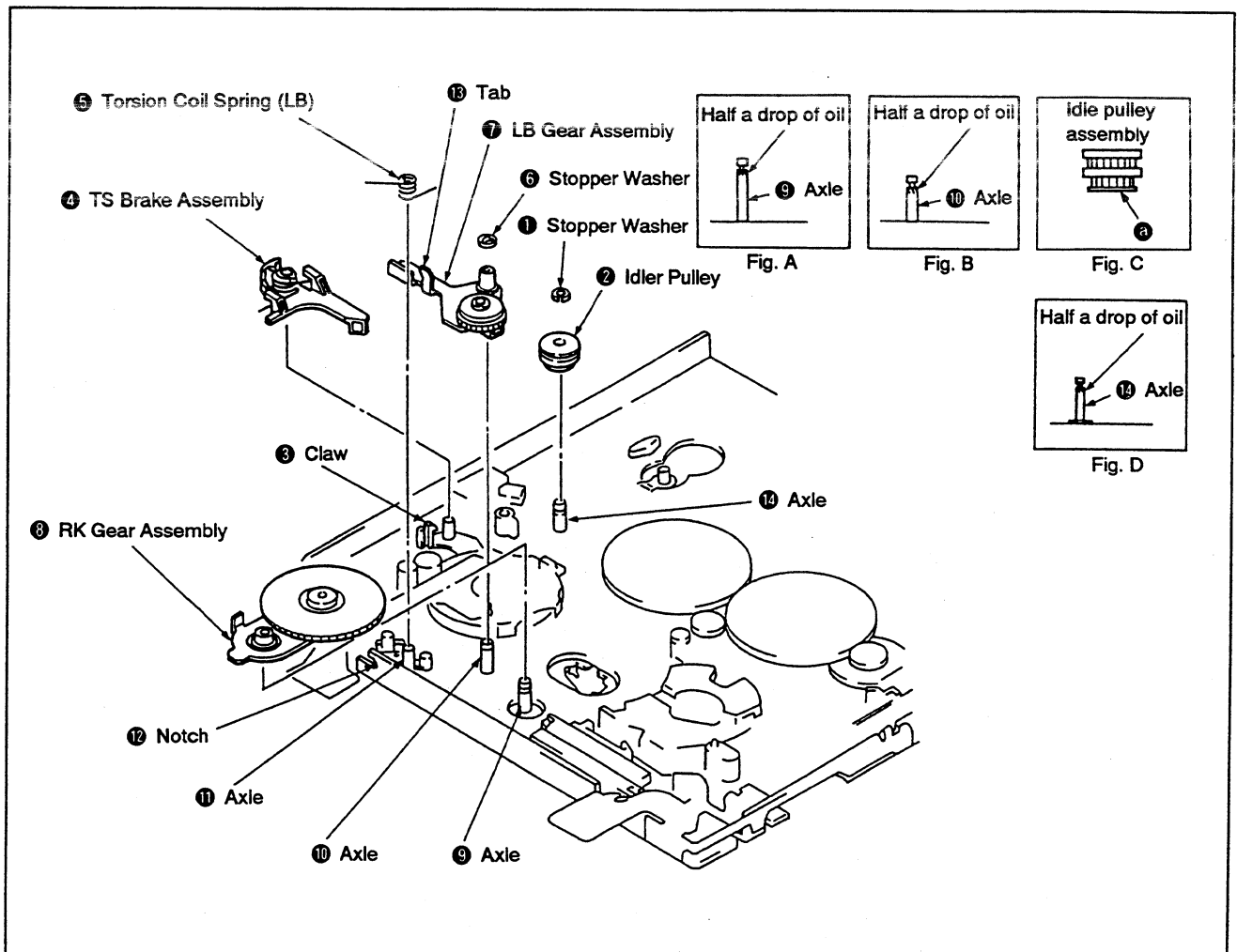


Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

- 1) Remove the switch lever assembly as described in section 3-14.
- 2) Remove the stopper washer ①, then remove the UL gear ②.
- 3) Remove the UL arm ③, the 1.6 mm-diameter poly washer ④ and the LB plate spring ⑤.
- 4) Remove the UL brake ⑥.

2. Installation (See Fig. 3-18.)

- 1) Mount the UL brake ⑥.
- 2) Apply half a drop of oil to the axle ⑦ (See Fig. A).
- 3) Mount the LB plate spring ⑤ to the axle ⑦ as shown in Fig. B, then install the 1.6mm-diameter poly washer ④.
- 4) Mount the UL arm ③ to the axle ⑦ so that the protrusion ⑧ comes into the groove ⑨ of the UL brake ⑥.
- 5) Mount the UL gear ② to the axle ⑦ and engage it with the gear of the drive gear (left) assembly ⑩.
- 6) Install the stopper washer ①.
- 7) Mount the switch lever assembly as described in section 3-14.

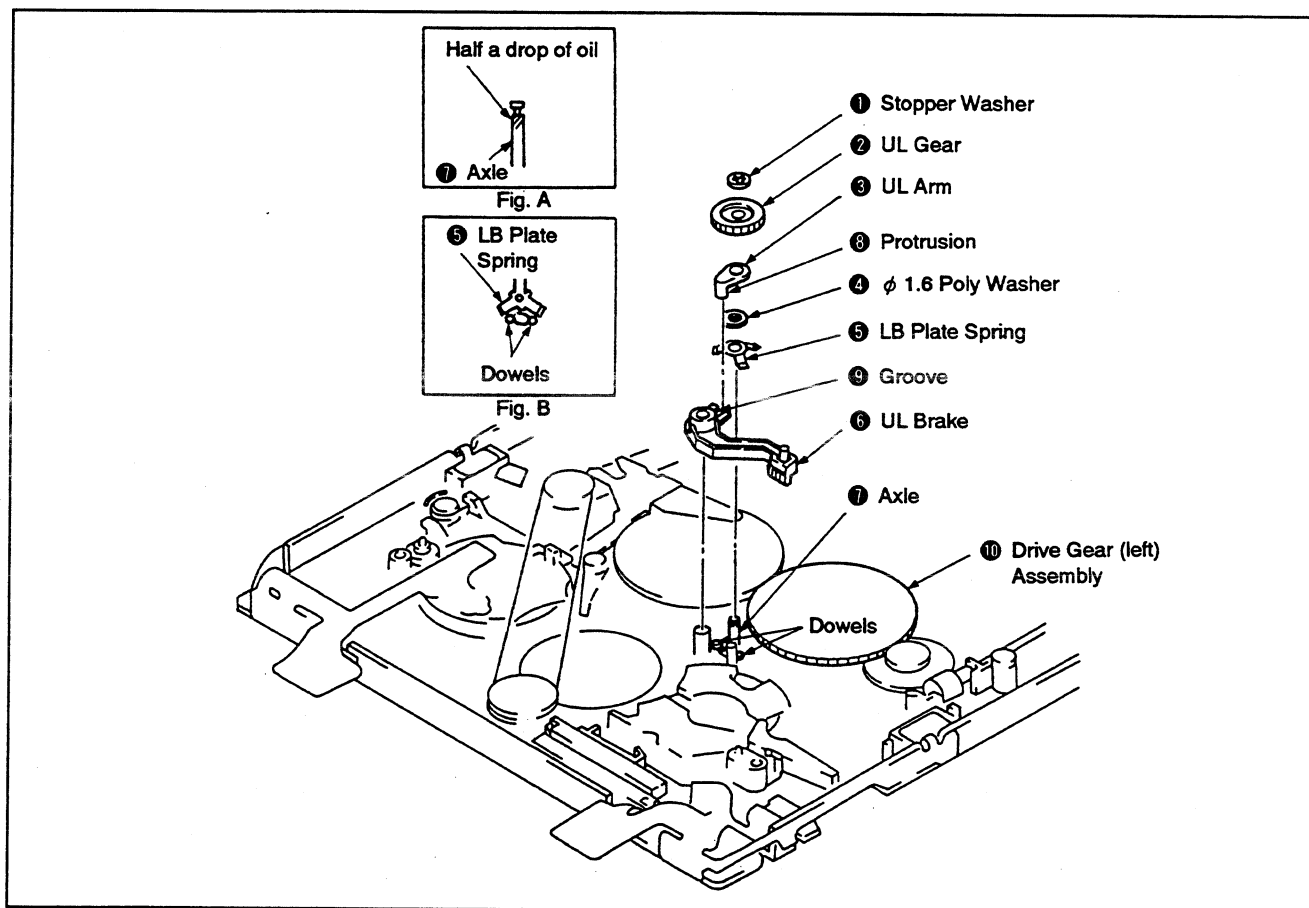


Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

1. Removal (See Fig. 3-19.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the drum unit as described in section 3-13.
- 3) Remove the switch lever assembly as described in section 3-14.
- 4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 5) Set the **STOP** mode.
- 6) Remove the screw ①, then remove the coaster plate spring ② and the coaster (right) assembly ③.
- 7) Remove the two screws ④, then remove the reinforcing plate TT ⑤.
- 8) Remove the stopper washer 1.5 ⑥, then remove the drive gear (right) assembly ⑦.

2. Installation (See Fig. 3-19.)

- 1) Grease the points of the mechanism chassis shown in Fig. A.
- 2) Apply half a drop of oil to the axle ⑧ (See Fig. F).
- 3) Grease pin ⑨, axle ⑩ and dowel ⑪ of the coaster (right) assembly ③ (See Fig. D).
- 4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
- 5) Move the brake release arm ⑫ in the direction of the arrow ⑬ to put it out of the way.

- 6) Mount the drive gear (right) assembly ⑦ to the axle ⑧, and engage it with the drive gear (left) assembly ⑬ as shown in Fig. B.
- 7) Align the ② part with the ⑥ part, and the hole ⑭ with the pin ⑨ of the coaster (right) assembly ③.
- 8) Install the stopper washer 1.5 ⑥.
- 9) Mount by aligning the coaster plate spring ② with the axle ⑩ of the coaster (right) assembly ③ and pin ⑨, then secure with the screw ①.
- 10) Mount the reinforcing plate TT ⑤ aligning it with the dowel ⑪, then tighten the two screws ④ in the indicated order.
- 11) Grease the points indicated in Figs. C and E.
- 12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 13) Mount the switch lever assembly as described in section 3-14.
- 14) Mount the drum unit as described in section 3-13.
- 15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:

- Screw ① should be tightened with a tightening torque of approx. 500g·cm. If tightened too much, the coaster (right) assembly ③ and the coaster plate spring ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

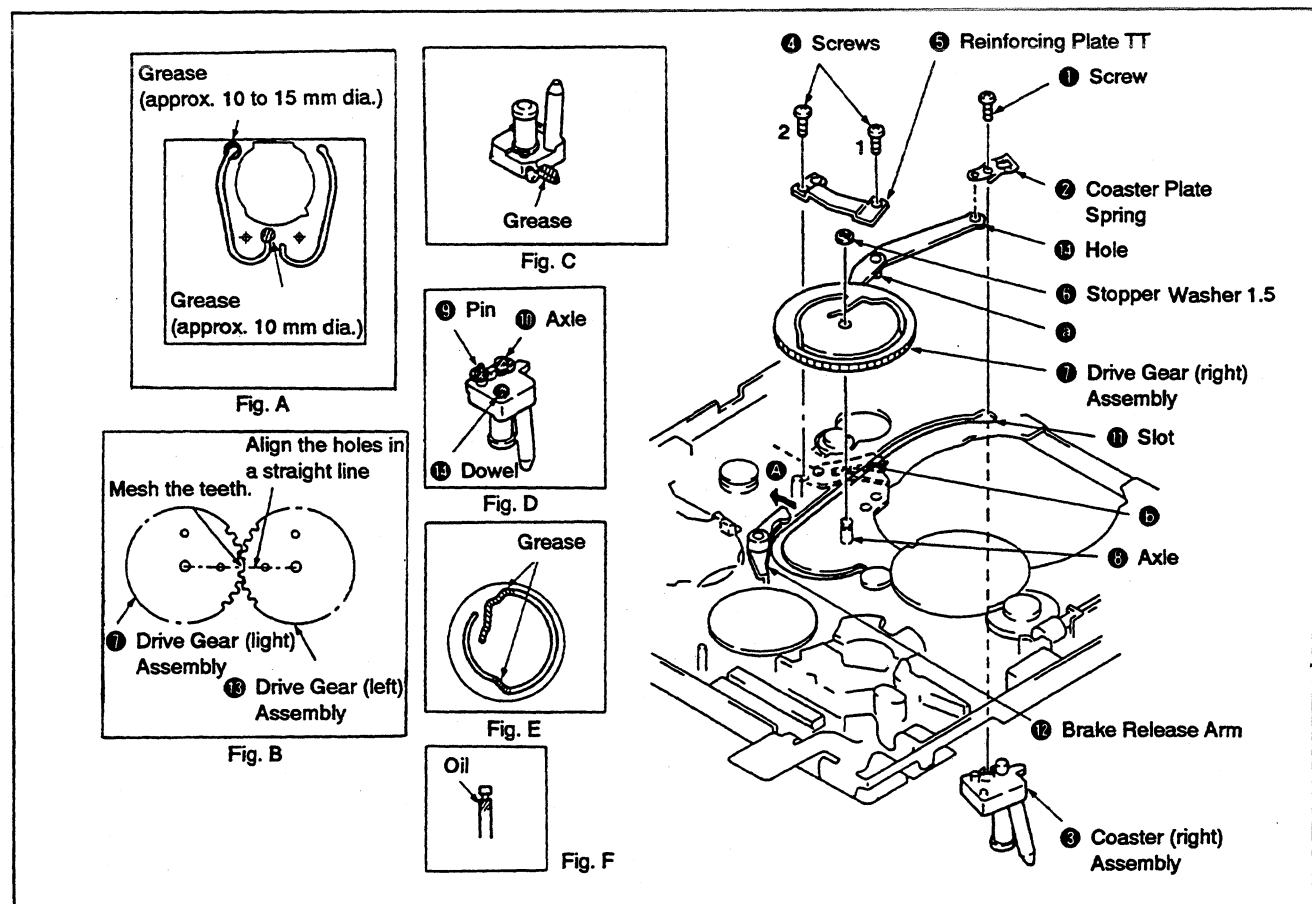


Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the drum assembly as described in section 3-13.
- 3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
- 4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 5) Remove the coaster (right) assembly and the drive gear (right) assembly as described in section 3-18.
- 6) Remove the screw ①, then remove the coaster plate spring ② and the coaster (left) assembly ③.
- 7) Remove the two screws ④, then remove the reinforcing plate SS assembly ⑤.
- 8) Remove the stopper washer 1.5 ⑥, then remove the drive gear (left) assembly ⑦.

2. Installation (See Fig. 3-20.)

- 1) Grease the points of the mechanism chassis shown in Fig. A.
- 2) Apply half a drop of oil to the axle ⑧ (See Fig. E).
- 3) Grease pin ⑨, axle ⑩ and dowel ⑬ of the coaster (left) assembly ③ (See Fig. B).
- 4) Mount by aligning the pin ⑨ and the axle ⑩ with the slot ⑪ of the mechanism chassis.
- 5) Fit the drive gear (left) assembly ⑦ to the axle ⑧, and mount so that the gear engages with the wheel gear ⑫ and the UL gear ⑬.

- 6) Align the ② part with the slot ⑪, and the hole ⑭ with the pin ⑨ of the coaster (left) assembly ③.
- 7) Install the stopper washer 1.5 ⑥.
- 8) Mount by aligning the coaster plate spring ② with the axle ⑩ and pin ⑨ of the coaster (left) assembly ③, then secure with the screw ①.
- 9) Mount the reinforcing plate SS assembly ⑤ aligning it with the dowel ⑬, then tighten the two screws ④ in the indicated order.
- 10) Grease points indicated in Figs. C and D.
- 11) Mount the coaster (right) assembly and the drive gear (right) assembly as described in section 3-18.
- 12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 14) Mount the drum assembly as described in section 3-13.
- 15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:

- Screw ① should be tightened with a tightening torque of approx. 500g·cm. If tightened too much, the coaster (right) assembly ③ and the coaster plate spring ② will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

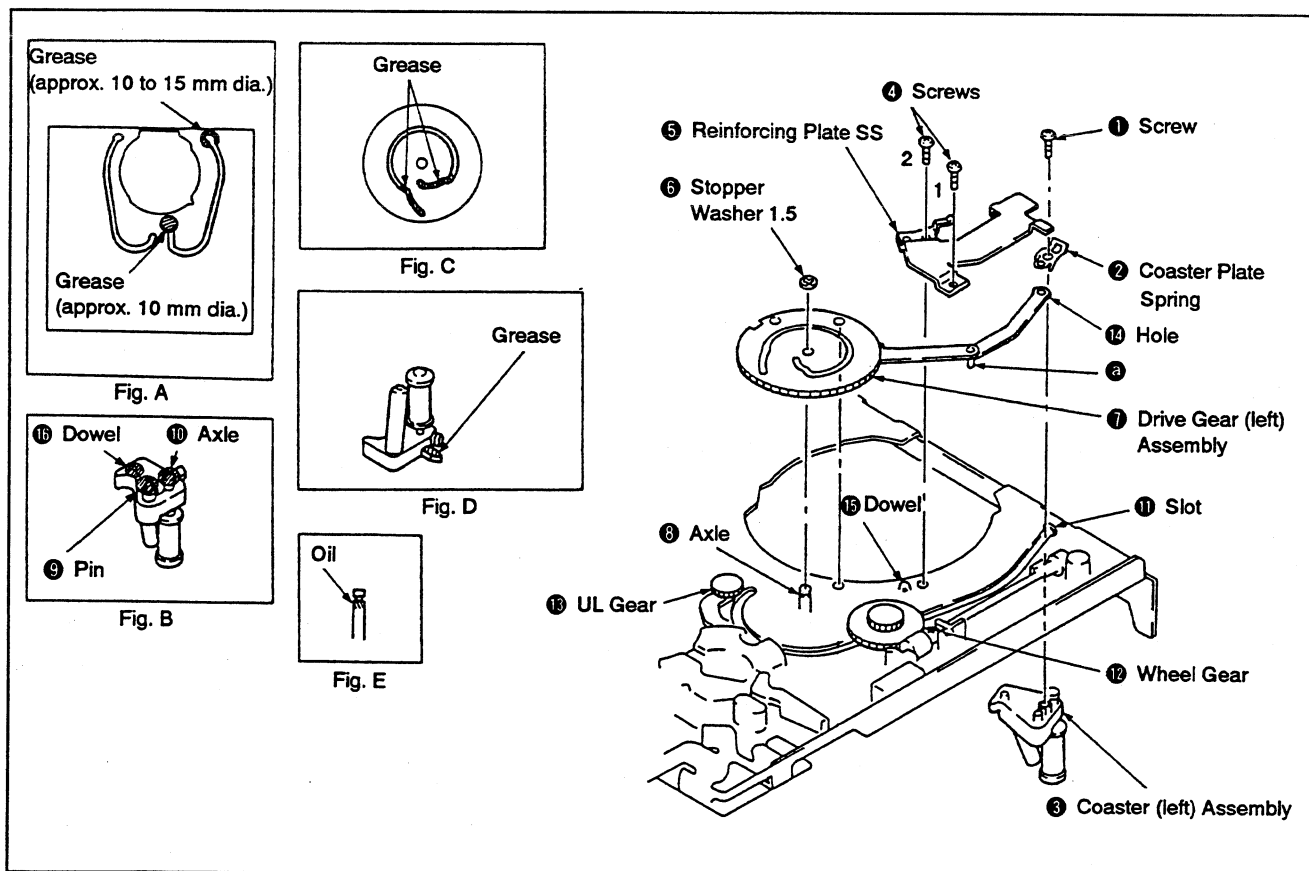


Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

- 1) Remove the DC motor (capstan motor) as described in section 3-3.
- 2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 4) Remove the drive gear (right) assembly as described in section 3-18.
- 5) Remove the drive gear (left) assembly as described in section 3-19.
- 6) Remove the two screws ①, then remove the loading motor assembly ②.
- 7) Remove the brake release arm ③.
- 8) Remove the stopper washer ④, then remove the wheel gear ⑤.
- 9) Remove the worm assembly ⑥ from the six claws ⑦.

2. Installation (See Fig. 3-21.)

- 1) Mount the worm assembly ⑥, matching it to the six claws ⑦.
- 2) Grease the shaded parts of the worm assembly ⑥ (five places) (see Fig A).
- 3) Apply half a drop of oil to the axle ⑧ (See Fig. B).
- 4) Fit the wheel gear ⑤ to the axle ⑧ and engage it with the gear of the worm assembly ⑥.
- 5) Mount the brake release arm ③.
- 6) Grease the whole perimeter of the gear of the loading motor assembly ②.
- 7) Align the loading motor assembly ② with the mechanism chassis and secure it with the two screws ②.
- 8) Mount the drive gear (left) assembly as described in section 3-19.
- 9) Mount the drive gear (right) assembly as described in section 3-18.
- 10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
- 11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
- 12) Mount the DC motor (capstan motor) as described in section 3-3.

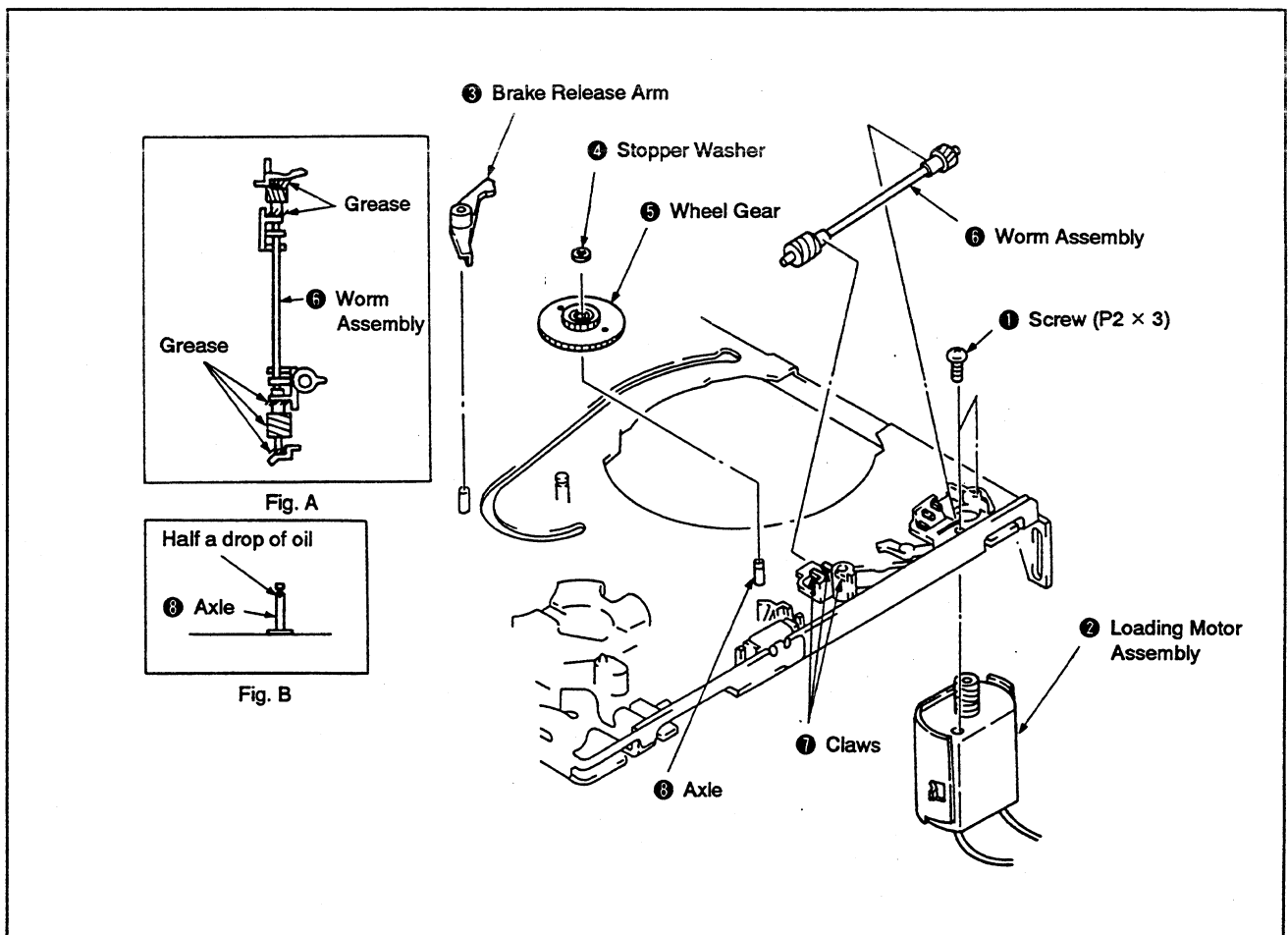


Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.
- 1) Detach the six solderings ⑧, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
- 2) Remove the two screws ① (See Fig. 3-22).
- 3) Mount the jig ④ (Ref. No. J-7) with the two supplied screws ②, then screw the attached hexagon socket screws ③ to the jig ④. The rotary upper drum ⑤ will move upward and come off (See Fig. 3-23).

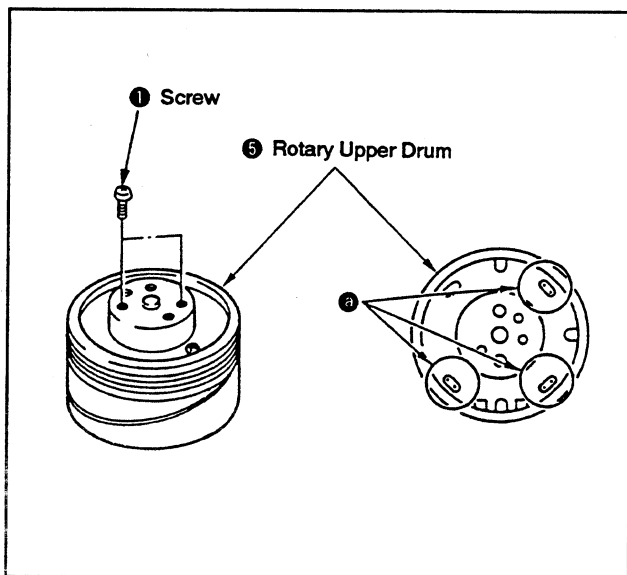


Fig. 3-22.

2. Installation

- 1) Wipe clean the flange surface and the rotary upper drum ⑤ surface that makes contact with it, and confirm that they are free from dirt and scratches.
 - 2) Insert the jig ⑦ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ⑤ by passing the jig through its positioning hole ⑥.
- Note:** Confirm that the terminals ⑧ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
- 3) Remove the jig ⑦ and push down the rotary upper drum ⑤ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ① alternately.
 - 4) Insert the jig ⑦ into the positioning hole ⑥ again and confirm that it goes in smoothly. If it does not, loosen the two screws ①, repeat step 3 of the Removal paragraph and restart the setting procedure.
 - 5) Tighten the screws ①.
 - 6) Solder the terminals ⑧ (② in Fig. 3-22).

Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

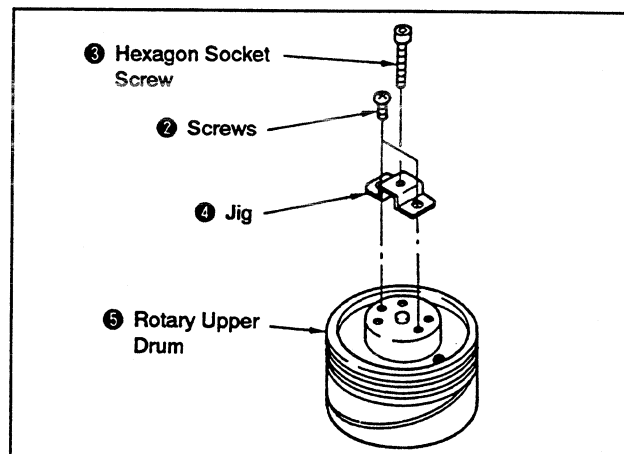


Fig. 3-23.

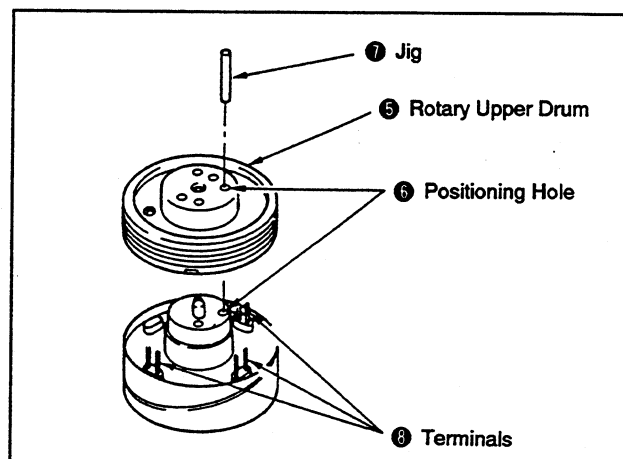


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

- 1) Set the torque cassette (Ref. No. J-6).
- 2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g*cm.
- 3) If the torque value does not meet the specification, adjust the adjust arm ①.

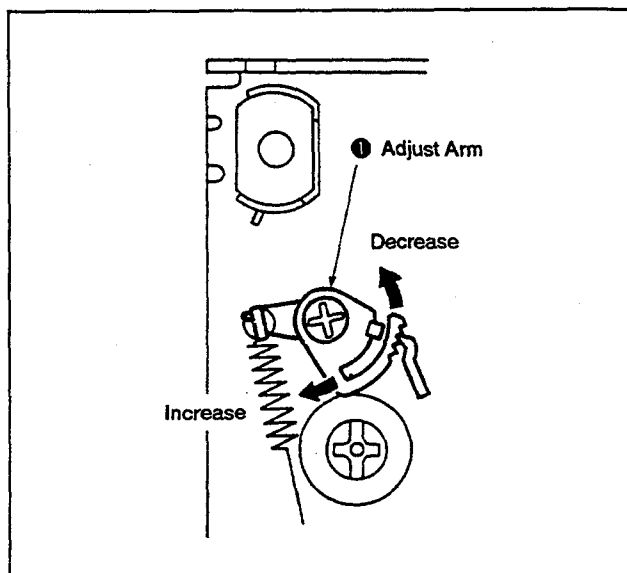


Fig. 3-25.

3-23. REEL TORQUE CHECK

- 1) Set the torque cassette.
- 2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g*cm.
- 3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g*cm.
- 4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g*cm.
- 5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.

Example:

NTSC GV-8

PAL GV-8E

Connect Pins ① and pin ③ of CN017 on the

{ SV-34 board (GV-8) } to pin ② of it. (See Fig. 4-1)
{ SV-35 board (GV-8E) }

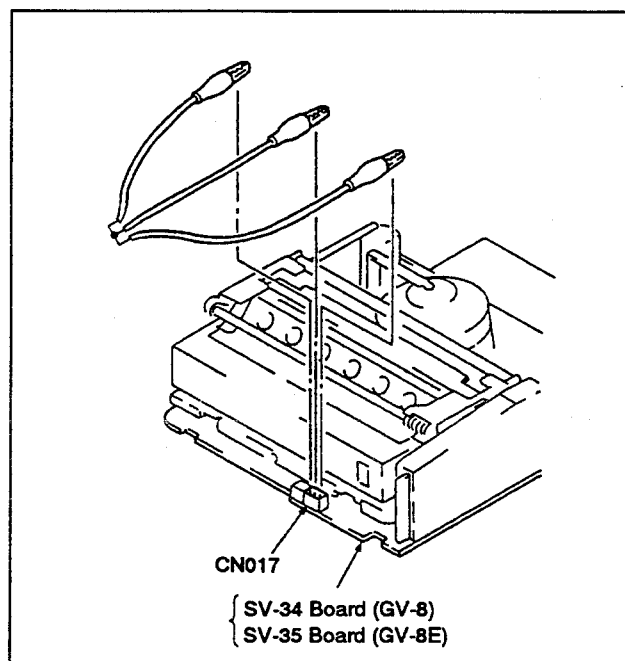


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).

Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.

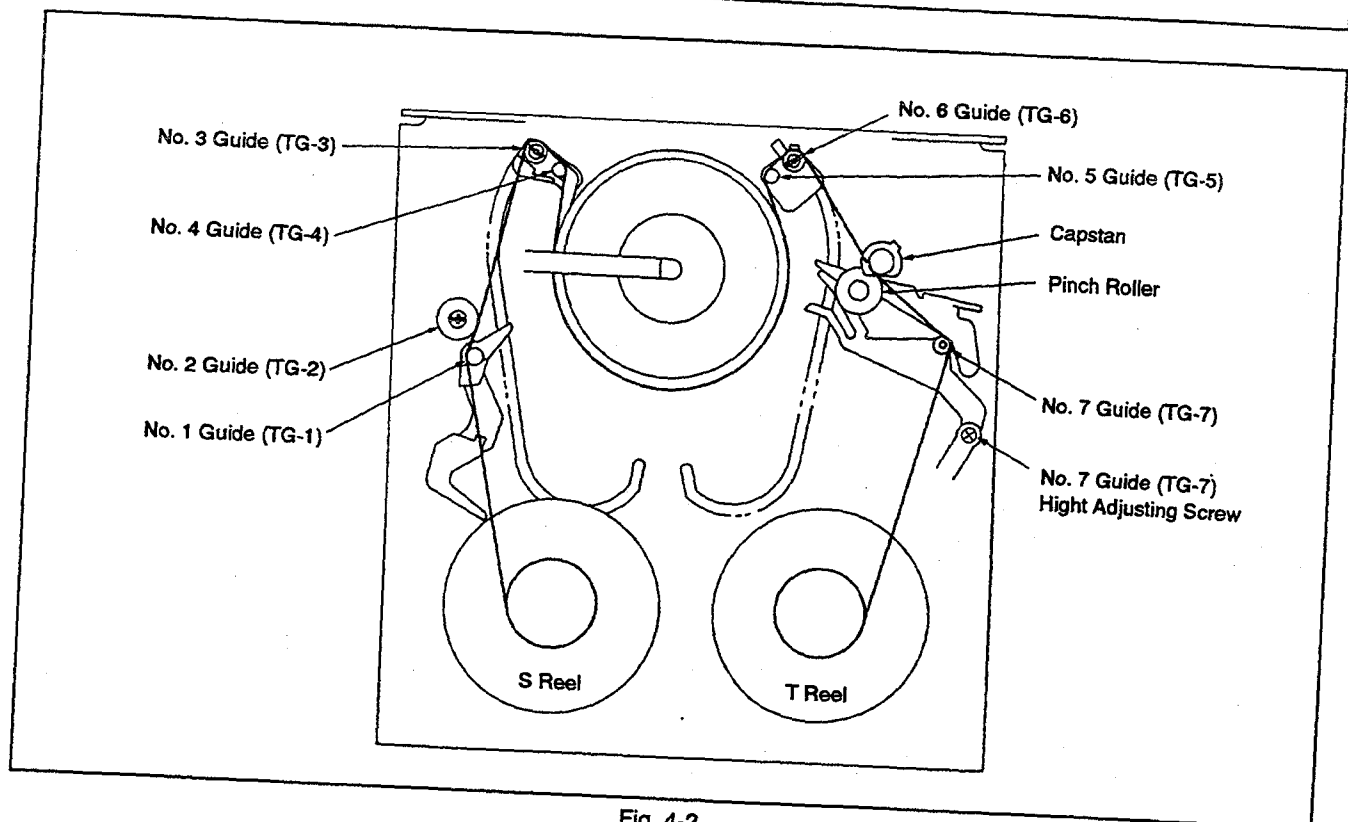
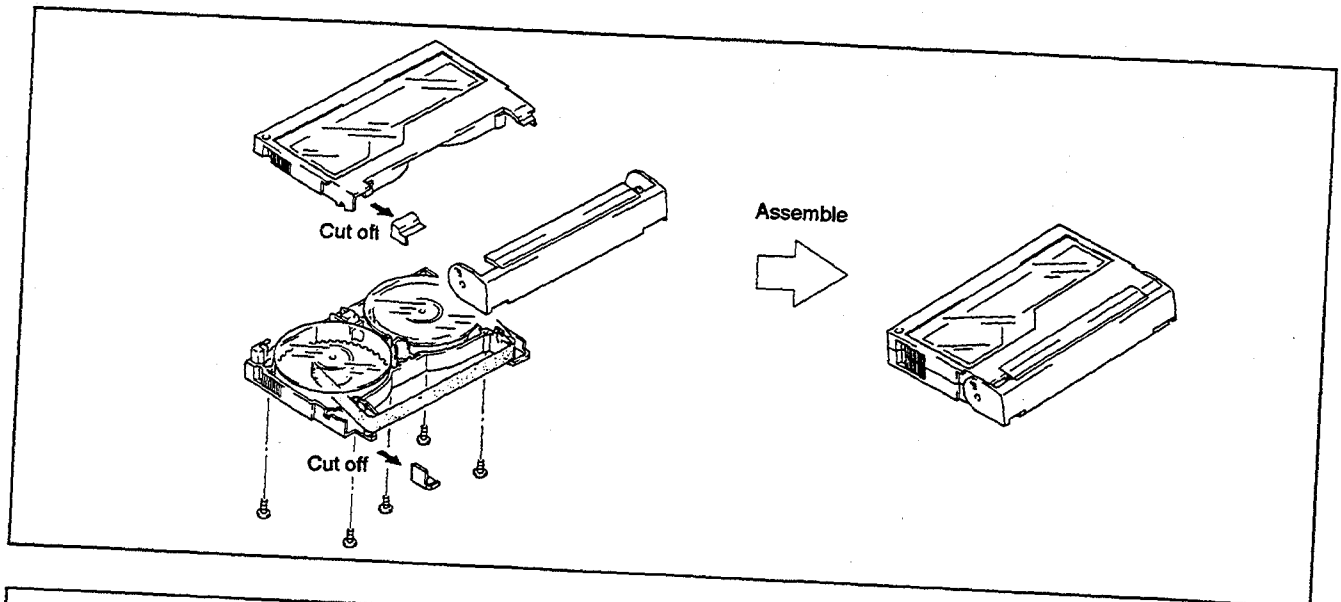


Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

- 1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
- 2) Connection of oscilloscope and output method of waveform.
CH 1: RF signal output of the drum head (V RF OUT)
Method for signal output:
Short-circuit the external trigger output (RF SW. P) and GND.

Example:

NTSC GV-8

PAL GV-8E

CH 1: Pin ③ (V RF OUT) of CN018 on the

- { SV-34 board (GV-8)
- { SV-35 board (GV-8E)

Method for signal output:

Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the

- { SV-34 board (GV-8)
- { SV-35 board (GV-8E)

- 3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
- 4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

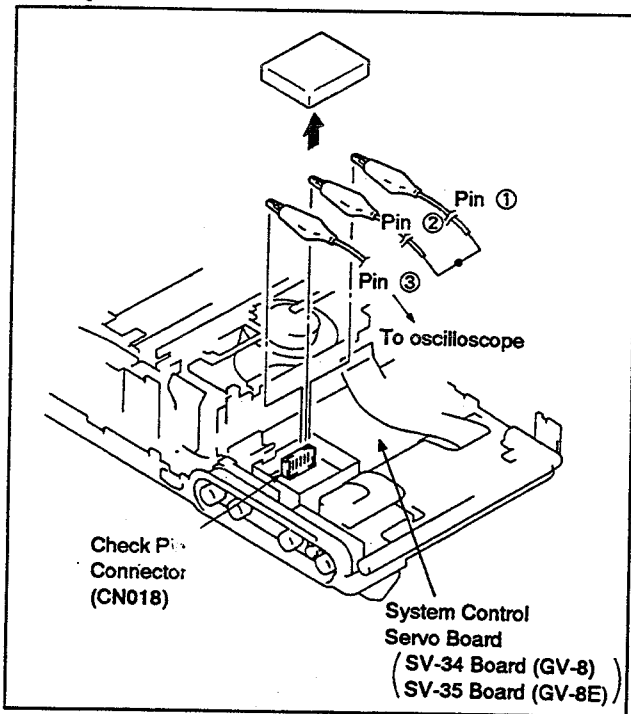


Fig. 4-3.

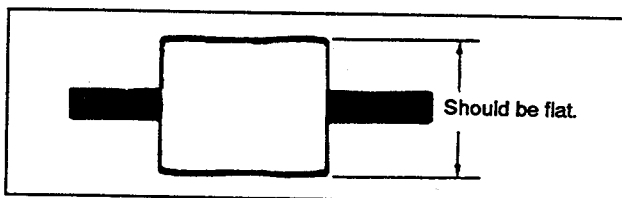


Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

- 1) Play back the alignment tape for tracking adjustment.
- 2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ①, loosen the lock screw ② a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ③.
- 3) Pass a hexagonal wrench, screwdriver or the like through the hole ④, loosen the lock screw ⑤ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ⑥.

Note: Take care not to loosen lock screws too much, since guides come loose easily.

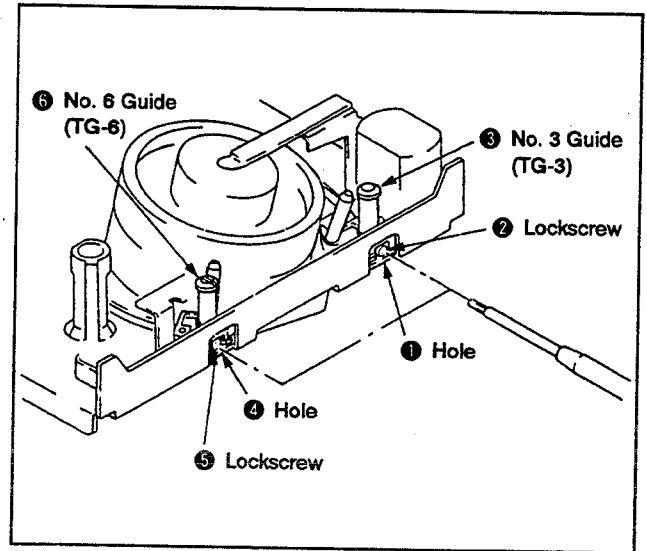


Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

- 1) Play back the alignment tape for tracking adjustment and set the track shift mode.
- 2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
- 3) Fix the No. 3 guide ③ by tightening its lock screw ②. Then confirm that the entrance side waveform has not changed.
- 4) Fix the No. 6 guide ⑥ by tightening its lock screw ⑤. Then confirm that the exit side waveform has not changed.

Note: The set screws ② and ⑤ should be tightened with a tightening torque of approx. $200\text{g}\cdot\text{cm} \pm 10\%$.
If tightened too much, there is danger of damaging the thread.

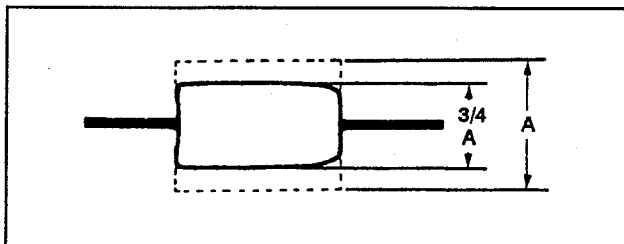


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

- 1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ① upper surface to 18.6 mm by rotating the TG-2 upper flange ①.

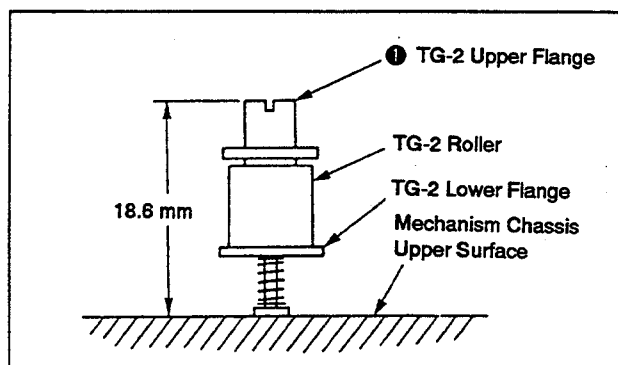


Fig. 4-7.

[Reference]

This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

- 1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
- 2) Confirm that the tape is not bent at the lower flange ② of the No. 2 guide (TG-2) ① (See Fig. 4-8). If it is, turn the upper flange ③ of the No. 2 guide (TG-2) ① clockwise with a screwdriver, lowering it until the tape is straightened.
- 3) Play back the alignment tape for tracking adjustment.
- 4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
- 5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
- 6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ③ of the No. 2 guide (TG-2) ① 90° counter-clockwise and repeat step 5.

Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

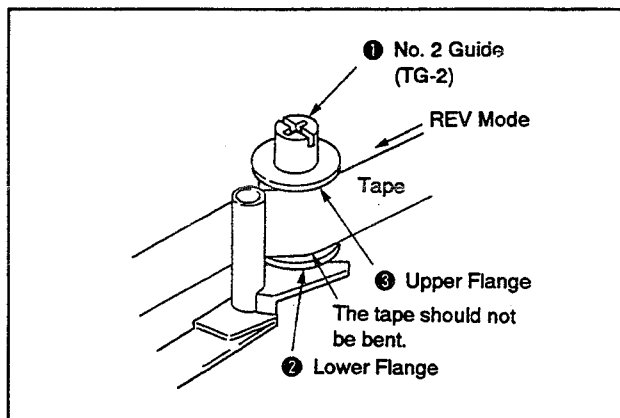


Fig. 4-8.

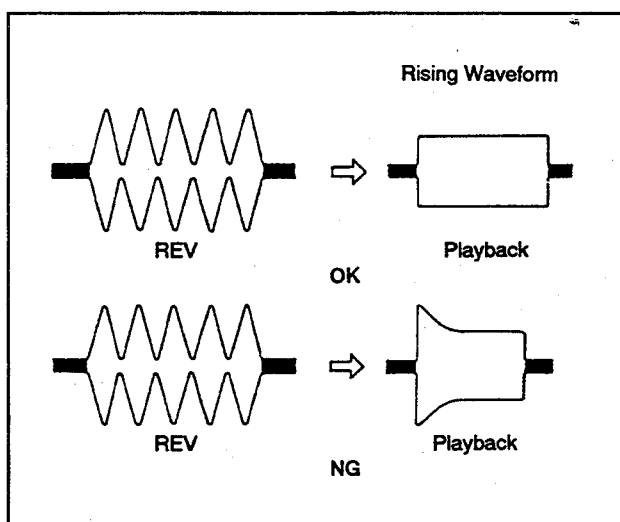


Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

- 1) Play back the alignment tape for tracking adjustment and set the REV mode.
- 2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ① and the capstan ②. If it is, turn the height adjusting screw ④ of the No. 7 guide (TG-7) ③ until the tape is straightened.
- 3) Set the playback mode again and confirm that the tape is not bent between the capstan ② and the height adjusting screw ④ of the No. 7 guide (specification: 0.5 mm or less). If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ③ until bending is within the specification (0.5 mm). If in the REV mode tape bending between the No. 6 guide (TG-6) ① and the capstan ② is 0.3 mm or less, adjustment can be considered completed.

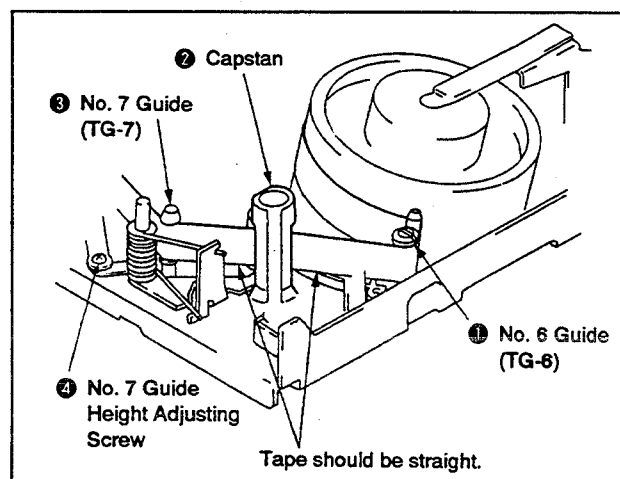


Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

- 1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
- 2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

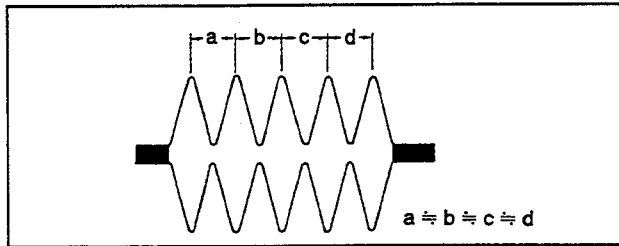


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

- 1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
- 2) Then, confirm that the minimum amplitude value (E_{MIN}) is 65% of the maximum value (E_{MAX}) or larger (See Fig. 4-13).
- 3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

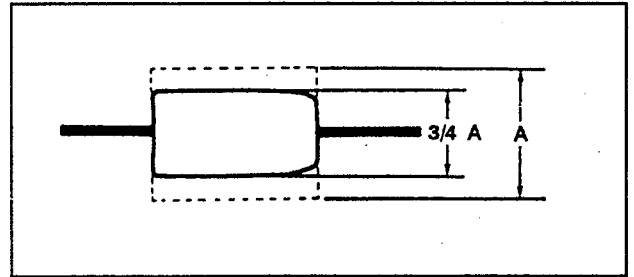


Fig. 4-12.

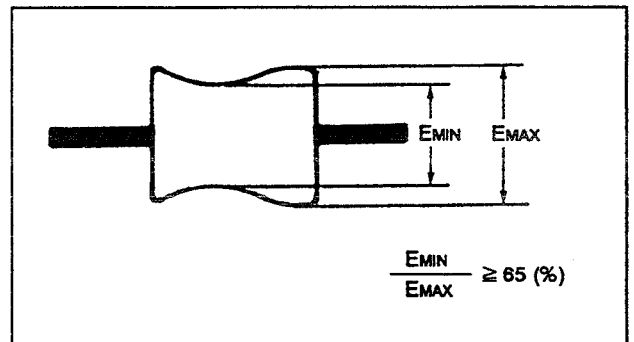


Fig. 4-13.

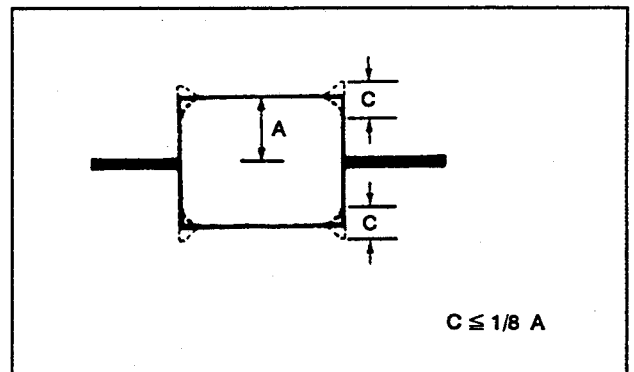


Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

- 1) Play back the alignment tape for tracking adjustment.
- 2) Cancel the track shift mode.
- 3) Eject the tape, then load it again.
- 4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
- 5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
- 6) Repeat steps 3) to 5) once more.

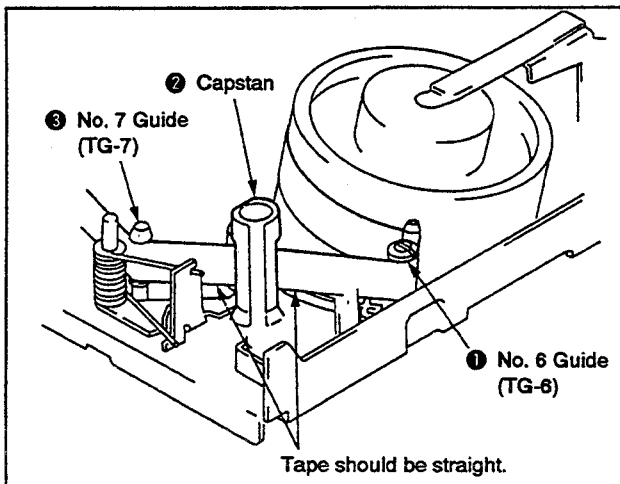


Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

- 1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
- 2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

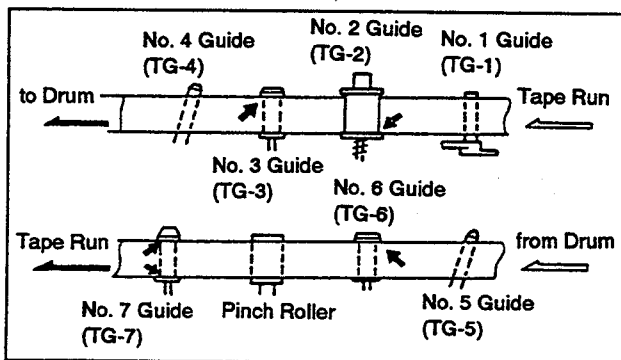


Fig. 4-16.